Why study at the University of Pretoria?

- **A trusted reputation**
  With more than a hundred years of outstanding academic and research achievement, the University of Pretoria has been the country's leading research university with the highest research output per annum since 1997.

- **Think globally, act locally**
  The University of Pretoria offers the widest range of academic qualifications at university level in South Africa, with a strong focus on local and international partnerships.

- **Develop career-centred skills**
  An intellectually stimulating and innovative environment develops students with competitive skills and practical leadership abilities. Specialised support services ensure that students can achieve the greatest degree of academic success.

- **Feel at home**
  Twenty-seven student residences offer a study and living environment to many students from outside Pretoria. New facilities can accommodate mobility-impaired persons and the University annually improves the older facilities that are often used, such as residences, sports facilities, lecture halls and function venues.

- **Safety on campus**
  Security Services creates and maintains a safe environment aimed at ensuring a quality student life through innovative measures and services that include access control on all campuses, 24-hour Operational Management Centre, 24-hour emergency reaction vehicle, 24-hour alarm monitoring and crime investigations.
  24-hour Operational Manager: +27 (0) 83 654 0476
  24-hour Operational Centre: +27 (0) 12 420 2310/2760
  Crisis number: 0800 0064 28 (toll-free)

- **World-class sports facilities**
  The University offers world-class sports facilities and training with opportunities for students to participate in various sports at club, national and international level.

- **Express your artistic talents**
  Vibrant and culturally diverse student activities contribute to a balanced campus life. Students are encouraged to participate in the arts, culture and music, as well as to join any of a number of cultural organisations. Cultural events offered on campus include art and film festivals, choir performances, music concerts and literary competitions.

- **Experience the weird and the wonderful**
  Rare objects in more than 52 diverse collections range from works by the old masters to golden artefacts from Mapungubwe.

- **Connect to a global gateway of knowledge**
  With more than 1.4 million volumes and access to a vast number of electronic books, journals, reference works and databases, the University's libraries offer a world-class learning environment by providing a gateway to global information and an extensive research library network with customised services for all students.

- **Participate in a balanced student life**
  Graduates from the University of Pretoria are world-class people. They are well-rounded individuals who are balanced, responsible citizens and understand and appreciate social, political, economic, technological and environmental contexts.
The Faculty of Engineering, Built Environment and Information Technology at the University of Pretoria offers undergraduate programmes that are not only at the forefront of the various disciplines, but also equip graduates to be leaders in their chosen professions. The key to the Faculty’s success is the high premium it places on innovation. This is embodied in its approach to training, training methods and research, but above all, in the wealth-creating attitude nurtured in its students.

The Faculty comprises 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 is one of the largest of its kind in the country and provides by far the greatest number of graduates. This is also applicable to the School for the Built Environment, which covers the entire spectrum of programmes in the built environment. The School of Information Technology is unique and the first of its kind in South Africa, where students have the advantage of an integrated approach to information technology (IT).

Training and research programmes are supported by the Faculty’s Institute for Technological Innovation and the Graduate School of Technology Management – both the first and only ones of their kind in South Africa.

The University of Pretoria aims to be internationally competitive, while at the same time being locally relevant. The Faculty of Engineering, Built Environment and Information Technology supports this goal by ensuring that the training and research programmes always meet the highest standards. National and international accreditation of degree programmes show that the Faculty is serious about ensuring that the market value of the degrees awarded by UP will always have a competitive advantage for its students. The Faculty adds value to its degrees, thus making its students sought after.

The Faculty’s programmes are accessible to everybody who meets its academic standards. The University also has various financial schemes to assist deserving students with bursaries and loans.

Prof Roelf Sandenbergh
Dean: Faculty of Engineering, Built Environment and Information Technology
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## Study programmes

### School of Engineering

- **Grade 11 results** are considered for the provisional admission of prospective students.
- A valid National Senior Certificate (NSC) with admission for degree purposes is required.
- Minimum subject and level requirements, as set out below, are required. At first-year level, students have a choice between Afrikaans and English as language medium. In many instances, lectures are only offered in English, for example for elective modules, specialist modules, where a lecturer is not competent in Afrikaans, or where it is not economically or practically justifiable.
- Provisional admission to the Four Year Programme in the School of Engineering is only guaranteed if prospective students meet all the subject requirements. If they do not, prospective students must write the Institutional Proficiency Test (IPT). The results of the IPT, together with their NSC results, will determine whether prospective students qualify for admission to the Four Year Programme or the Five Year Programme: the Engineering Augmented Degree Programme (ENGAGE).
- Provisional admission to the Four or the Five Year Programme in the School of Engineering will be determined based on the fact that a candidate complies with the NSC minimum requirement of 5 (60-69%) for Afrikaans or English, 6 (70-79%) for Mathematics and 5 (60-69%) for Physical Science, and has an APS of 30. The results of the compulsory IPT are also taken into account.
- Admission to ENGAGE (the Five Year Programme) in the School of Engineering will be determined on the basis of faculty selection, the results of the IPT, the NSC, an achievement of 5 (60-69%) for Mathematics, 4 (50-59%) for Physical Science and 4 (50-59%) for Afrikaans or English, and an APS of 25.
- Please note that prospective students may apply directly for entry into the Five Year Programme (ENGAGE). (More on p. 18.)

### The requirements for the following degrees are:

<table>
<thead>
<tr>
<th>Programme Duration Closing date</th>
<th>Afrikaans or English</th>
<th>Mathematics</th>
<th>Physical Science</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEng(Chemical Engineering) [4 years] Closing date: 30 September</td>
<td>Careers: Chemical engineers are involved in industrial processes that convert raw materials into products with a higher economical value. This is achieved by means of physical, thermal, chemical, biological or mechanical changes to the raw materials. Industries where chemical engineers apply their knowledge are 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, also need the expertise chemical engineers can offer. 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. (More on p. 6.)</td>
<td>7 (80-100%) or 6 (70-79%) provided 7 (80-100%) is obtained in Physical Science</td>
<td>6 (70-79%)</td>
<td>36 25-35 (must write IPT)</td>
</tr>
<tr>
<td>BEng(Civil Engineering) [4 years] Closing date: 30 September</td>
<td>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, waterworks and outfall installations. They are involved in financial modelling, feasibility studies, and the management and rehabilitation of large asset portfolios. (More on p. 7.)</td>
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</tr>
<tr>
<td>BEng(Computer Engineering) [4 years] Closing date: 30 September</td>
<td>Careers: Computer engineers are active in all fields of the &quot;Information Super Highway&quot; and the information and communication technology (ICT) world, which include the fields of 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. (More on p. 8.)</td>
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</tr>
<tr>
<td>BEng(Electrical Engineering) [4 years] Closing date: 30 September</td>
<td>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. (More on p. 10.)</td>
<td></td>
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</tr>
<tr>
<td>BEng(Electronic Engineering) [4 years] Closing date: 30 September</td>
<td>Careers: Electronic engineers are active in all fields, for example, telecommunications (fixed network, wireless, satellite, television, radar and radio frequency), entertainment, medicine (MRI, X-ray, CPR, IR tomography, EEG, ECG, rehabilitation engineering and biokinetics), integrated circuit design, bio-engineering, military (vehicle electronics, smart bombs, night vision and laser systems), transport (e-tag, speed measuring, railway signalling, GPS and mapping), SMART dust, safety and security systems (face and speech recognition), banking (ATM), commerce, robotics, education, environmental management, tourism and many more. (More on p. 12.)</td>
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</tr>
<tr>
<td>BEng(Industrial Engineering) [4 years] Closing date: 30 September</td>
<td>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 the 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. (More on p. 13.)</td>
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</tbody>
</table>

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FOR MORE INFORMATION: www.up.ac.za
**Study programmes**

**BEng(Mechanical Engineering)**

[4 years]

Closing date: 30 September

**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 (for example, design, testing and improvement of mechanical, electrical, pneumatic and hydraulic systems), marine engineering and naval architecture, bio-medical engineering, air-conditioning and refrigeration, aerospace systems and aircraft/missiles engineering, vehicle engineering, maintenance engineering and energy management (for example, gas and steam turbines, nuclear power reactors, petrol engines, cooling towers and renewable energy systems). (More on p 14.)

**BEng (Metallurgical Engineering)**

*Presented in English only*

[4 years]

Closing date: 30 September

**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. The types of careers include those of production engineers, plant managers, consultants and researchers. (More on p 15.)

**BEng(Mining Engineering)**

*Presented in English only*

[4 years]

Closing date: 30 September

**Careers:** Mining engineers have a wide range of opportunities, namely mining (mine management, technical management of ventilation, rock mechanics, rock breaking and mineral resources), financial evaluation and management (mine design, mine financial evaluation, mine feasibility studies and mine environmental impact studies), mining and drilling contracting (mining, tunnelling, shaft sinking, mine development and ore evaluation), mining research, mining equipment design and manufacture, mining marketing and mining administration at national, provincial or international level. (More on p 16.)

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**School for the Built Environment**

All the programmes in the School for the Built Environment involve selection procedures based on academic merit. For BSc(Architecture), BSc(Landscape Architecture) and BSc(Interior Architecture) selection is based on academic merit, departmental selection tests and an interview.

All the Built Environment degree programmes have a limited capacity. Only first choices will be considered for BSc(Architecture), BSc(Landscape Architecture) and BSc(Interior Architecture).

---

**The requirements for the following degrees are:**

<table>
<thead>
<tr>
<th>Programme Duration Closing date</th>
<th>Afrikaans or English</th>
<th>Mathematics</th>
<th>Physical Science</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BSc(Architecture)</strong> [3 years]</td>
<td><strong>Considered only as first study choice.</strong> Selection course: selection includes an interview. Closing date: 30 June.</td>
<td>5 (60–69%)</td>
<td>4 (50–59%)</td>
<td>4 (50–59%)</td>
</tr>
<tr>
<td><strong>Careers:</strong> Candidate senior architectural technologist is the first step to registration as an architect. Technologists can design designated building types and also provide assistance in practice to architects, interior architects and urban designers. Their responsibilities include the documentation of projects, project administration and site management. A further two years of study is required for registration as a candidate professional architect. (More on p 19.)</td>
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</table>

<table>
<thead>
<tr>
<th>Programme Duration Closing date</th>
<th>Afrikaans or English</th>
<th>Mathematics</th>
<th>Physical Science</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BSc(Interior Architecture)</strong> [3 years]</td>
<td><strong>Considered only as first study choice.</strong> Selection course: selection includes an interview. Closing date: 30 June.</td>
<td>5 (60–69%)</td>
<td>4 (50–59%)</td>
<td>4 (50–59%)</td>
</tr>
<tr>
<td><strong>Careers:</strong> Candidate interior designer is the first step to future registration as a senior interior designer or interior architect. Technologists provide assistance in practice to interior architects and designers, architects and product designers. Their responsibilities include the documentation of projects, project administration and site management. A further two years of study will in future be required for registration as a candidate professional interior architect. (More on p 20.)</td>
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</table>

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<table>
<thead>
<tr>
<th>Programme Duration Closing date</th>
<th>Afrikaans or English</th>
<th>Mathematics</th>
<th>Physical Science, Life Science or Geography</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BSc(Landscape Architecture)</strong> [3 years]</td>
<td>Selection course Closing date: 30 June</td>
<td>5 (60–69%)</td>
<td>4 (50–59%)</td>
<td>4 (50–59%)</td>
</tr>
<tr>
<td><strong>Careers:</strong> Candidate senior landscape architectural technologists can design designated building types. It is also the first step to registration as a landscape architect. Technologists provide assistance in practice to landscape architects, architects, urban designers and environmental practitioners. Their responsibilities include the documentation of projects, project administration and site management. A further two years of study is required for registration as a candidate professional landscape architect. (More on p 20.)</td>
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</tbody>
</table>
### Study Programmes

<table>
<thead>
<tr>
<th>Programme Duration Closing date</th>
<th>Afrikaans or English</th>
<th>Mathematics</th>
<th>Physical Science or Accounting</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Town and Regional Planning</td>
<td>3 years</td>
<td>5 (60–69%)</td>
<td>4 (50–59%)</td>
<td>25</td>
</tr>
</tbody>
</table>

**Careers:** Town and regional planner, development practitioner, urban manager, real estate analyst, researcher. 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 CSIR and the HSRC, non-governmental organisations, community-based organisations, major financial institutions and property developments groups. The qualification will enable a graduate to register as a professional town and regional planner with the South African Council for Planners. (More on p 26.)

### School of Information Technology

All modules in the School of Information Technology are presented in Afrikaans and English where possible.

In the School of Information Technology, students are admitted to the Four Year Programme in BIS (Multimedia) and the Four Year Programme in BSc(IT) Information and Knowledge Systems based on faculty selection, the results of a compulsory Institutional Proficiency Test, results of the final Grade 12 examination, as well as achievement levels in the following subjects: 4 (50–59%) for Afrikaans or English and 3 (40–49%) for Mathematics, together with an APS of 25.

**FOR MORE INFORMATION:** www.up.ac.za

<table>
<thead>
<tr>
<th>Programme Duration Closing date</th>
<th>Afrikaans or English</th>
<th>Mathematics</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td>B(Information Technology) [4 years] Closing date: 30 September</td>
<td>5 (60–69%)</td>
<td>5 (60–69%)</td>
<td>30</td>
</tr>
</tbody>
</table>

Careers: Information technologist, programmer, systems analyst, computer consultant, buyer of hardware and software. This programme provides knowledge and understanding of the theory and practice of programming and software engineering, 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. Should a candidate obtain an APS of 25 to 29, the compulsory Institutional Proficiency Test must be written. Consideration for admission will be based on the results of the Institutional Proficiency Test, provided the quotas regarding student numbers have not been reached. (More on p 28.)

<table>
<thead>
<tr>
<th>Programme Duration Closing date</th>
<th>Afrikaans or English</th>
<th>Mathematics</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc(Computer Science) [3 years] Closing date: 30 September</td>
<td>5 (60–69%)</td>
<td>5 (60–69%)</td>
<td>30</td>
</tr>
</tbody>
</table>

Careers: Programmer, systems analyst, systems architect, consultant, database administrator, network analyst, researcher. Should a candidate obtain an APS of 25 to 29, the compulsory Institutional Proficiency Test must be written. Consideration for admission will be based on the results of the Institutional Proficiency Test, provided the quotas regarding student numbers have not been reached. (More on p 30.)
### Study programmes

The requirements for the following degrees are:

<table>
<thead>
<tr>
<th>Programme</th>
<th>Duration</th>
<th>Closing date</th>
<th>Afrikaans or English</th>
<th>Mathematics or Mathematical Literacy</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIS (Multimedia)</td>
<td>[3 years]</td>
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<tr>
<td>Four Year Programme available.</td>
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<tr>
<td>See important information.</td>
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<tr>
<td>Closing date: 30 September</td>
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<tr>
<td>Careers:</td>
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<tr>
<td>Programmer, web designer, animation specialist, video editor, electronic artist.</td>
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<tr>
<td>The programme prepares students for work at any of the following content producers: paper publications, television, radio, phone technologies and the web. Graduates can become hardcore coders and work for a programming company. They can develop their skills in a particular area of interest, such as digital music or video, programming, graphic development, games development and web development. Should a candidate obtain an APS of between 25 and 29, a compulsory institutional Proficiency Test must be written. Consideration for admission will be based on the results of the Institutional Proficiency Test, provided the quotas regarding student numbers have not been reached. (More on p 32.)</td>
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</table>

<table>
<thead>
<tr>
<th>Programme</th>
<th>Duration</th>
<th>Closing date</th>
<th>Afrikaans or English</th>
<th>Mathematics or Mathematical Literacy</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIS (Information Science)</td>
<td>[3 years]</td>
<td></td>
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</tr>
<tr>
<td>Four Year Programme also available.</td>
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<tr>
<td>See important information.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Closing date: 30 September</td>
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<td></td>
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<tr>
<td>Careers:</td>
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<tr>
<td>A graduate will differentiate himself or herself in an application environment by choosing one of the following options: Applied Mathematics, Bioinformatics, Geographical Information Systems, IT and Enterprises, IT and Law, and Music, Operational Research, Philosophy, Psychology or Software Development. Should a candidate obtain an APS of 25 to 29, the compulsory Institutional Proficiency Test must be written. Consideration for admission will be based on the results of the Institutional Proficiency Test, provided the quotas regarding student numbers have not been reached. (More on p 30.)</td>
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</table>

### Programme Opportunities

**BCom (Informatics) [3 years]**

Refer to the Faculty Brochure for Economic and Management Sciences, p 18–19. (More on p 29.)
## School of Engineering

### Department of Chemical Engineering

**BEng(Chemical Engineering)**

### What does the discipline 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 mineral processing, water and effluent treatment, and the generation of electrical power. These industries are collectively referred to as the process industry. Few industries do not employ people with training in chemical engineering.

### Career opportunities

A chemical engineer may be involved in any of the following stages of a process project, from the inception of the idea to the sale of the final product:

- 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 the 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 modern aids, such as computers and 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 in special 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. Modern 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. 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 the process control of chemical production plants, optimisation, materials (with an emphasis on polymers), tribology (lubrication) and reactor engineering.

### Contact details:

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

### Curriculum

#### First year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphical Communication</td>
<td>Calculus</td>
</tr>
<tr>
<td>Calculus</td>
<td>Linear Algebra</td>
</tr>
<tr>
<td>Physics</td>
<td>Electricity and Electronics</td>
</tr>
<tr>
<td>General Chemistry</td>
<td>Mechanics</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>General Chemistry</td>
</tr>
<tr>
<td>Computer Literacy</td>
<td>Chemical Engineering</td>
</tr>
<tr>
<td>Innovation</td>
<td>Information Literacy</td>
</tr>
</tbody>
</table>

#### Second year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculus</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Differential Equations</td>
<td>Numerical Methods</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Programming and Data Processing</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Strength of Materials</td>
<td>Engineering Statistics</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>Thermodynamics</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>Community-based Project</td>
</tr>
</tbody>
</table>

#### Third year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Economics</td>
<td>Project Management</td>
</tr>
<tr>
<td>Transfer Processes</td>
<td>Process Dynamics</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>Kinetics</td>
</tr>
<tr>
<td>Mass Transfer</td>
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<tr>
<td>Chemical Engineering</td>
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<tr>
<td>Practical Training</td>
<td>Design</td>
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#### Fourth year

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<th>First semester</th>
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<tr>
<td>Professional Ethics and Practice</td>
<td>Design Project</td>
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<tr>
<td>Chemical Engineering</td>
<td>Process Analysis and Synthesis</td>
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<td>Process Control</td>
<td>Research Project</td>
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<td>Reactor Design</td>
<td>Environmental Management</td>
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<td>Research Project</td>
<td>Practical Training</td>
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Department of Civil Engineering

BEng(Civil Engineering)

What does the discipline entail?
Civil engineers create facilities that improve the quality of life of man 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. Civil engineers 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, 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 that the civil engineer helps 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. Both 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.

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First year

<table>
<thead>
<tr>
<th>First semester</th>
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<td>• Graphical Communication</td>
<td>• Calculus</td>
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<td>• Calculus</td>
<td>• Linear Algebra</td>
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<tr>
<td>• General Chemistry</td>
<td>• Physics</td>
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<td>• Materials Science</td>
<td>• Mechanics</td>
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<td>• Computer Literacy</td>
<td>• Electricity and Electronics</td>
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<td>• Innovation</td>
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<td>• Workshop Practice</td>
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Second year

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<tr>
<td>• Calculus</td>
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<td>• Differential Equations</td>
<td>• Numerical Methods</td>
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<tr>
<td>• Strength of Materials</td>
<td>• Structural Analysis</td>
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<td>• Communication Skills</td>
<td>• Pavement Materials and Design</td>
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<td>• Geomaterials and Processes</td>
<td>• Engineering Statistics</td>
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<tr>
<td>• Surveying</td>
<td>• Civil Engineering Measure-ment</td>
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<td>• Community-based Project</td>
<td>Techniques</td>
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Third year

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<tr>
<td>• Hydraulics</td>
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<td>• Structural Analysis</td>
<td>• Geotechnical Engineering</td>
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<td>• Engineering Economics</td>
<td>• Civil Building Materials</td>
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<td>• Programming and Data Processing</td>
<td>• Steel Design</td>
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<td>• Soil Mechanics</td>
<td>• Reinforced Concrete Design</td>
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<td>• Timber Design</td>
<td>• Transportation Engineering</td>
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Fourth year

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<tr>
<td>• Hydraulics</td>
<td>• Environmental Geotechnology</td>
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<td>• Research Project</td>
<td>• Civil Engineering</td>
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<td>• Steel Design</td>
<td>• Construction Management</td>
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<td>• Reinforced Concrete Design</td>
<td>• Design Concept</td>
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<td>• Transportation Planning</td>
<td>• Detailed Design</td>
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<td>• Professional Ethics and Practice</td>
<td>• Public Presentation</td>
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<td>• Practical Training</td>
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Mr Bhabhalazi Bulunga (Divisional Executive: Human Resources, Eskom), Talia da Silva and Prof Elsabé Kearsley, Head of Department: Civil Engineering

Talia Simone da Silva obtained the highest average mark of all students in South African universities during 2009 in the Civil Engineering degree. In recognition of this achievement, UP awarded her R10 000 and Eskom awarded her the top merit award to the value of R5 500 at the Eskom Academic Award Ceremony.
Department of Electrical, Electronic and Computer Engineering

BEng(Computer Engineering)

What does the discipline entail?

Computer engineering is one of the three internationally accepted and closely related subdisciplines of the broad field of electrical engineering (electrical engineering, electronic engineering and computer engineering). Computer engineering entails 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 disciplines, transport systems (hardware and software) and communication systems. A computer engineer is someone with a flair 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.

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, computer systems and control software. With the dramatic increase in computing and storage capabilities, small size and affordable cost, most technological systems include these components of computer engineering. It is essential to be well prepared for the rewarding life of a computer engineer.

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

Computer engineering is used in almost all application fields, especially telecommunications, computer networking, cellphone operations, computer system companies, military technologies (avionics, night vision, electronic warfare, smart bombs, drones, laser target designators), transport technologies (railroads), 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, entrepreneur or self-employed. Research and development opportunities are available at 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: think of a problem to be solved, and come up with a solution, even possibly patenting the idea. The academic 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), electromagnetics/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 Studies 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 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 assure competition and critical learning?

• Are there sufficient job opportunities for this discipline (both now and for the next 50 years)?

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

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Dr Saurabh Sinha (Function Head: Marketing)
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E-mail: saurabh.sinha@up.ac.za

With the amazing support and opportunities I enjoyed in the EBIT Faculty I have equipped myself with high-tech engineering skills and I am now busy with a PhD through the Computational Intelligence Research Group in the Computer Science Department. This degree allows me to be both creative and analytical, while giving me the opportunity to solve a varied set of interesting real-world problems. I have presented my work at conferences in Hawaii, Singapore, Hong Kong, Norway and Spain and twice I undertook research visits to the University of Nottingham (UK). The exposure has been invaluable to me. Winning the S.A. Bronze medal for the best master’s dissertation was wonderful too. As an industrial engineer at Denel Dynamics, I am working on the development of unmanned aerial vehicles and missile systems – and I am also investigating the development of a two-dimensional sense-and-avoidance system, which is capable of autonomously detecting and avoiding obstacles in its path.

Jacomine Grobler
BEng(Electrical Engineering)

What does the discipline 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 flair 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. With the worldwide crisis in 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. These are extremely exciting times 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 power and energy are consumed. Every known piece of equipment requires a source of energy - powered by mains, battery or photovoltaic (PV) - and needs the skill of an electrical engineer. 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, towns, shopping malls and factories. 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 power or energy and control the use of 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 man's 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 stability, lamps and lighting, power supplies, 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 anywhere 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 CSIR and Transnet. This provides an opportunity to innovate and participate in the exciting world of electrical engineering. Transmission, distribution and utilisation. An innovative approach to management and leadership skills will assure a long and prosperous career. The academic 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.

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 Studies, 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 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 assure competition and critical learning?

• Are there sufficient job opportunities for this discipline (both now and for the next 50 years)?

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

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First year
First semester
Second semester
• Graphical Communication
• Calculus
• General Chemistry
• Materials Science
• Computer Literacy
• Innovation
• Recess Training
• Measurement Techniques and Computer Modelling

Second year
First semester
Second semester
• Calculus
• Differential Equations
• Dynamics
• Electrical Engineering
• Introduction to Programming
• Communication Skills
• Community-based Project
• Recess Training
• Practical Wiring

Third year
First semester
Second semester
• Engineering Economics
• Electromagnetism
• Microprocessors
• Analogue Electronics
• Electrical Machines
• Recess Training
• DSP Programming

Fourth year
First semester
Second semester
• Project
• Professional Ethics and Practice
• Electrical Drives
• Power System Analysis
• Automation
• Recess Training
• Practical Training and Report

The Department of Mechanical and Aeronautical Engineering provides a challenging, yet comprehensive syllabus, which has increased my technical ability enormously, but I made a choice to commit myself to achieving my personal goals, and try to make use of all the opportunities and facilities provided. I have noticed that as the spectrum of my knowledge increases, I can apply it in a vast number of professional fields. In 2009, I won the first place in the National Innovation Competition for my Entrepreneurial Business Plan and I also received a scholarship from the Aeronautical Society of South Africa.

Nicholas Nouwens
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 flair 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 new electronic systems being developed all over the world, it is essential to be well prepared for the rewarding life 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 application fields, especially those of telecommunications (cellphones, television, GPS), transport (aeroplanes, ships, trains, cars), consumer equipment (i-Pods, induction stoves, fridges, microwaves, televisions), the 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, space travel and communication, security (day and night, entrance control, face recognition) and photonics (lasers, optical fibres, networking).

The electronic engineer has to be innovative and 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 size and with much more control and artificial intelligence. Typical subsystems that form part of larger electronic systems are amplifiers, transmitters, receivers, speed control, sensor systems, motor control, power supplies, radio frequency (RF) subsystems, and micro- and nanoelectronics. Most electronic systems use a standard process of measurement (sensing), calculate/compare/store information and control outputs (actuators) with extensive computing and communication power.

Career opportunities

Electronic 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, entrepreneur or self-employed. Research and development opportunities are available at electronics and microelectronics companies in South Africa and all over the world. This provides the opportunity to innovate: to think of a problem to be solved and to come up with a solution, possibly even patenting the idea. The academic 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); electromagnetic range (the compact antenna and radar range); broadband wireless multimedia communications (the Sentech Chair); photonics and telecommunications (the Centre for Radio and Digital Communication). 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 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 assure competition and critical learning?
- Are there sufficient job opportunities for this discipline (both now and for the next 50 years)?

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

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First year

First semester
- Graphical Communication
- Calculus
- General Chemistry
- Materials Science
- Computer Literacy
- Innovation
- Recess Training
- Measurement Techniques and Computer Modelling

Second semester
- Calculus
- Linear Algebra
- Electricity and Electronics
- Mechanics
- Physics
- Information Literacy
- Innovation

Second year

First semester
- Calculus
- Differential Equations
- Dynamics
- Electrical Engineering
- Introduction to Programming
- Communication Skills
- Community-based Project

Second semester
- Mathematics
- Numerical Methods
- Engineering Statistics
- Linear Systems
- Digital Systems
- Community-based Project

Third year

First semester
- Engineering Economics
- Electromagnetism
- Analogue Electronics
- Microprocessors
- Modulation Systems

Second semester
- Project Management
- Microwaves and Antennas
- Stochastic Communication Systems
- Control Systems
- Electronic Engineering Design

Fourth year

First semester
- Project
- Professional Ethics and Practice
- DSP Programming and Application
- Advanced Electronics
- Automation
- Recess Training
- Practical Training and Report

Second semester
- Project
- Specialisation
- Environmental Management

Department of Industrial and Systems Engineering

BEng(Industrial Engineering)

What does the discipline 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 within 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

"My degree in Industrial Engineering is incredibly versatile, challenging and has taught me analytical thinking and creative problem-solving. Graduates in my field can step into almost any industry and integrate systems and skills to provide the most efficient, economical and least adverse solutions to problems, while improving the quality of life.

The demand for industrial engineers remains large. I received the Magna FS Award for top first-year achiever in Industrial Engineering, the Fourier Approach Award for the top second-year achiever in Industrial Engineering and a UP bursary for the top 20 first-year enrolments. I am also a member of the Golden Key International Honours Society and I appear on the Dean's Merit List."

Tania Terblanche

Faculty of Engineering, Built Environment and Information Technology
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 in academia and in practice. This department is the largest of its kind in South Africa and currently has more than 500 students. Its 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.

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Department of Materials Science and Metallurgical Engineering
BEng(Metallurgical Engineering)
What does the discipline 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 some 60% 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 the 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 metallurgy:

- Minerals processing: processing the ores obtained from mines to release and concentrate the valuable metals and minerals from the mineral resource.
- Extractive metallurgy: processing the concentrate received from the minerals processing plants through pyrometallurgical (“pyro” means “fire”, and high temperatures are used in the extraction process), hydrometallurgical (“hydro” means “water”, and water-based solutions are used in the extraction process) or electrometallurgical (extraction processes involving the plating of the metals through electrical processes) routes.
- Materials engineering: developing or researching engineering materials to improve the end products made from different metals. The metallurgical engineer designs materials to suit a specific application.

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. Unconditional accreditation by the Engineering Council of South Africa is confirmation of the quality of undergraduate teaching and the degree currently enjoys international recognition. Its staff consult and perform research for industry and maintain close contact with local metallurgical industries to ensure that teaching and research are in line with industry needs. The Industrial Metals and Minerals Research Institute was established at the department in 2000 and has equipment to the value of R30 million. This equipment is used to conduct research projects for the private sector and is also used for research projects in the Department to enhance research outputs. The Metallurgical Student Association is fully run by students who organise activities, such as action cricket, ten-pin bowling and an annual sports day.

Each year group has a member of the teaching staff as a mentor to assist with any problems students might have. The Department supports its first-year students by means of a mentorship programme to ensure that they adjust to their new environment. Its students are highly sought after by the metallurgical industry.

Additional information
Visit the website of the Department at http://www.up.ac.za/metal.
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 and companies such as Arcelor Mittal, Columbus Stainless, Highveld Steel and Vanadium, Scaw, Davsteel, AngloGold, De Beers, Samancor, BHP Billiton, Amcoal, X-trastra, Mintek, the Council for Scientific and Industrial Research, Hatch Africa and Pyromet.

Contact details:
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Fax: +27 (0)12 362 5304
E-mail: metallurgical.eng@up.ac.za
Website: www.up.ac.za/metal

### First year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Graphical Communication</td>
<td>• Calculus</td>
</tr>
<tr>
<td>• Electricity and Electronics</td>
<td>• Linear Algebra</td>
</tr>
<tr>
<td>• Materials Science</td>
<td>• General Chemistry</td>
</tr>
<tr>
<td>• Calculus</td>
<td>• Mechanics</td>
</tr>
<tr>
<td>• Computer Literacy</td>
<td>• Information Literacy</td>
</tr>
<tr>
<td>• Innovation</td>
<td>• Physics</td>
</tr>
<tr>
<td></td>
<td>• Innovation</td>
</tr>
<tr>
<td></td>
<td>• Workshop Practice</td>
</tr>
</tbody>
</table>

### Second year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Calculus</td>
<td>• Mathematics</td>
</tr>
<tr>
<td>• Differential Equations</td>
<td>• Numerical Methods</td>
</tr>
<tr>
<td>• Dynamics</td>
<td>• Electrical Engineering</td>
</tr>
<tr>
<td>• Programming and Data Processing</td>
<td>• Materials Science</td>
</tr>
<tr>
<td>• Mineralogy</td>
<td>• Process Thermodynamics</td>
</tr>
<tr>
<td>• Communication Skills</td>
<td>• Engineering Statistics</td>
</tr>
<tr>
<td>• Community-based Project</td>
<td>• Community-based Project</td>
</tr>
</tbody>
</table>

### Third year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Materials Science</td>
<td>• Hydrometallurgy</td>
</tr>
<tr>
<td>• Minerals Processing</td>
<td>• Pyrometallurgy</td>
</tr>
<tr>
<td>• Engineering Economics</td>
<td>• Refractory Materials</td>
</tr>
<tr>
<td>• Thermofluids</td>
<td>• Mechanical Metallurgy</td>
</tr>
<tr>
<td>• Electrochemistry</td>
<td>• Project Management</td>
</tr>
<tr>
<td></td>
<td>• Excursions</td>
</tr>
<tr>
<td></td>
<td>• Practical Training</td>
</tr>
</tbody>
</table>

### Fourth year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Process Metallurgy and Control</td>
<td>• Project</td>
</tr>
<tr>
<td>• Literature Survey</td>
<td>• Process Design</td>
</tr>
<tr>
<td>• Hydrometallurgy</td>
<td>• Environmental Management</td>
</tr>
<tr>
<td>• Minerals Processing</td>
<td>• Practical Training</td>
</tr>
<tr>
<td>• Metals Processing</td>
<td>•</td>
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</tbody>
</table>

### Department of Mechanical and Aeronautical Engineering

#### BEng(Mechanical Engineering)

**What does the discipline 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 is 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 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

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 career in one of the following areas: research, design, development, manufacturing, commissioning, maintenance or marketing of mechanical and aeronautical equipment and products. Later in their career, they will typically decide between being a technical specialist engineer or a senior manager. 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

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I am currently a fourth-year Mechanical and Aeronautical Engineering student. No matter where, or what, you study, be prepared to work hard and independently. I was fortunate to win the following academic awards: top first-year student in 2007, top second-year student in 2008 (Sasol), top third-year student in 2009 (Sasol), top third-year design student in 2009 (Sasol) and an Aero Society of South Africa student bursary in 2009. I look forward to pursuing a career in flying or aviation.
and Aeronautical Engineering at the University of Pretoria, prospective students may rest assured that they will receive a first-class education, comparable to the best in the world. The international accreditation of the graduate programme by the Engineering Council of South Africa 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.

General enquiries and applications:
Prospective students
Client Service Centre
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Academic enquiries: Prospective students
Prof Josua Meyer (Head of Department)
Tel: +27 (0) 12 420 3104
Fax: +27 (0) 12 362 5124
E-mail: mecheng@up.ac.za
Website: www.me.up.ac.za

### Fourth year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Computational Mechanics</td>
<td>Option: Mechanical Engineering:</td>
</tr>
<tr>
<td>• Thermofluids</td>
<td>• Project</td>
</tr>
<tr>
<td>• Professional Ethics and Practice</td>
<td>• Thermal and Fluid Machines</td>
</tr>
<tr>
<td>• Practical Training</td>
<td>• Control Systems</td>
</tr>
</tbody>
</table>

Or
Option:

<table>
<thead>
<tr>
<th>Mechanical Engineering:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Design</td>
</tr>
<tr>
<td>• Mechanical Engineering: Project</td>
</tr>
</tbody>
</table>

Or
Option:

<table>
<thead>
<tr>
<th>Aeronautical Engineering:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Design</td>
</tr>
<tr>
<td>• Aeronautical Engineering: Project</td>
</tr>
</tbody>
</table>

### Department of Mining Engineering

**BEng(Mining Engineering)**

**What does the discipline entail?**

The profession of mining engineers encompasses a wide spectrum of engineering work – from mine evaluation to industrial control. For instance, they 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 are 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 for 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 and this contributes directly to the gross national product. The mining industry provides job opportunities for more than 400 000 people. Among these, there are naturally many employment opportunities for professionals. Currently, there is a shortage of mining engineers.

Behind the scenes

The number of students in the department is relatively small. Thus, it is possible for staff to give intensive attention to individual students. A great number of technical visits offers students the opportunity to get acquainted with every aspect of the industry. A characteristic of the mining engineering course is that close group cohesion develops among students and continues long after graduation.

Note: 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

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Website: www.up.ac.za/ebit/mining

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 do not have a strong enough background in Mathematics and Physical Science, academic literacy and information technology, and do not have the 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.

That 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. ENGAGE provides a carefully structured curriculum that helps students

First year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphical Communication</td>
<td>Calculus</td>
</tr>
<tr>
<td>Electricity and Electronics</td>
<td>Linear Algebra</td>
</tr>
<tr>
<td>Innovation</td>
<td>General Chemistry</td>
</tr>
<tr>
<td>Materials Science</td>
<td>Mechanics</td>
</tr>
<tr>
<td>Calculus</td>
<td>Physics</td>
</tr>
<tr>
<td>Computer Literacy</td>
<td>Information Literacy</td>
</tr>
</tbody>
</table>

Second year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamics</td>
<td>Surveying</td>
</tr>
<tr>
<td>Programming and Data Processing</td>
<td>Numerical Methods</td>
</tr>
<tr>
<td>Calculus</td>
<td>Engineering Statistics</td>
</tr>
<tr>
<td>Differential Equations</td>
<td>Thermodynamics</td>
</tr>
<tr>
<td>Strength of Materials</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>Community-based Project</td>
</tr>
</tbody>
</table>

Third year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Mining and Geotechnics</td>
<td>Industrial Excursions</td>
</tr>
<tr>
<td>Thermo Fluids</td>
<td>Engineering Economics</td>
</tr>
<tr>
<td>Introductory Geology</td>
<td>Explosive Engineering</td>
</tr>
<tr>
<td>Physical Geology</td>
<td>Mineral Economics</td>
</tr>
<tr>
<td>Minerals Processing</td>
<td>Project Management</td>
</tr>
</tbody>
</table>

Fourth year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mine Environmental Control Engineering</td>
<td>Environmental Management</td>
</tr>
<tr>
<td>Professional Ethics and Practice</td>
<td>Risk Management</td>
</tr>
<tr>
<td>Strata Control</td>
<td>Mine Design</td>
</tr>
<tr>
<td>Project</td>
<td>Ore Deposits</td>
</tr>
<tr>
<td>Structural Geology</td>
<td>Practical Training</td>
</tr>
<tr>
<td>Mining</td>
<td></td>
</tr>
<tr>
<td>Industrial Excursions</td>
<td></td>
</tr>
</tbody>
</table>

"I completed my degree in Mining Engineering in 2009 and I am currently enrolled for a BEng(Hons) in Technology Management. I was awarded the Alumni Gold Medal for Mining Design. I am proud of and grateful for the world-quality knowledge, exposure and experience I obtained at Tuks. It has already given my career a valuable kick-start and it is the reason why I decided to do my postgraduate studies at UP."

Barend Human
adjust to university life and cope with the demands of engineering studies. In ENGAGE, the volume of work is gradually increased and 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 programme

In ENGAGE, students take all of the modules of the four-year programme in the same classes as the four-year programme students, but spread them out over a longer time. In addition, for every 16-credit 100-level (first-year) module, students also take an 8-credit augmented module. For example, in the first semester students take the same Chemistry module (16 credits) as the four-year programme students, as well as Additional Chemistry (8 credits). In Additional Chemistry, 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 Chemistry module.

In the first year, ENGAGE students take the natural sciences modules that form the foundation of engineering, namely Chemistry, Physics and Mathematics. Computer Engineering students take Programming 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.

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

<table>
<thead>
<tr>
<th>Four-year programme modules</th>
<th>Foundation modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year</td>
<td></td>
</tr>
<tr>
<td>• 100-level natural science modules</td>
<td>• Additional module for each natural science module</td>
</tr>
<tr>
<td>• Professional Orientation</td>
<td></td>
</tr>
<tr>
<td>Second year</td>
<td></td>
</tr>
<tr>
<td>• 100-level engineering modules</td>
<td>• Additional module for each engineering module</td>
</tr>
<tr>
<td>• 200-level mathematics modules</td>
<td></td>
</tr>
<tr>
<td>Third year</td>
<td></td>
</tr>
<tr>
<td>• 200-level engineering modules</td>
<td>• None</td>
</tr>
<tr>
<td>Fourth year</td>
<td></td>
</tr>
<tr>
<td>• 300-level engineering modules</td>
<td>• None</td>
</tr>
<tr>
<td>Fifth year</td>
<td></td>
</tr>
<tr>
<td>• 400-level engineering modules</td>
<td>• None</td>
</tr>
</tbody>
</table>

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 programme, but they feel the necessity for more support.

OR

• Their marks in the National Senior Certificate do not meet the requirement for entry into the four-year programme, but do meet the requirements for the five-year programme. These students will be required to write the Institutional Proficiency Test.

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E-mail: engage@up.ac.za
Website: www.up.ac.za/academic/engage

The EBIT Faculty has over 9 000 students. Industrial Engineering makes me tick, because of its broad field of possible applications that are aimed at delivering better products and services and meeting South African business needs.

As an undergraduate I have been formed by being an elder at the Brooklyn Reformed Church; by serving as Treasurer for SAIBI TUKS (2008); by being a member of the Student Parliament (2008/09); by participating in the International Scholar Laureate Programme for Engineering in China (2009); by founding the EBIT Faculty House (2009); and by being selected by the International Association for the Exchange of Students for Technical Experience to do engineering vacation work in Barcelona, Spain (December 2009 and January 2010). I also attended the 2010 Brightest Young Minds Summit in Stellenbosch. I have been studying with a Sasol Mining bursary and was awarded the Golden Key New Member Chapter Award (2008), the best second-year Industrial Engineering student award (2008) and the best third-year Industrial Engineering student award (2009). Lastly, I received the SRC Award for Outstanding Leadership, Service and Achievement.
School for the Built Environment

Department of Architecture

The Department of Architecture presents programmes in architecture, interior architecture and landscape architecture. These careers employ science and art in the creation of worthwhile environments for users. The design professions of the built environment complement each other through their focus on the design and realisation of space. All three disciplines require innovators who can satisfy both the needs for rational thought and the creative spirit.

At the core of the curriculum is a studio-based culture, through which skills in design, theory, communication and management are developed. Projects done in the studio are informed by subject modules covering such diverse aspects as earth studies, construction, practice management, theory and history of the environment. Modules with programme-specific contents are introduced from the second year of study. The department endorses formal training that is academically and theoretically grounded and technologically informed.

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

BSc(Architecture)

Information on a career in architecture is available online at www.saia.org.za/education_careers.php

<table>
<thead>
<tr>
<th>Undergraduate (by coursework)</th>
<th>Minimum duration</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc(Arch)</td>
<td>At least one year of work or travel recommended</td>
<td>Three years (full-time, studio-based)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postgraduate (by coursework)</th>
<th>Minimum duration</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>BArch(Hons)</td>
<td>One year (full-time, studio-based)</td>
<td>Candidate architect</td>
</tr>
<tr>
<td>MArch(Prof)</td>
<td>One year (full-time, studio-based)</td>
<td></td>
</tr>
</tbody>
</table>

The BSc(Arch) qualification enables graduates to register with the South African Council for the Architectural Profession as candidate senior architectural technologists. In practice, technologists and/or junior designers provide assistance in the disciplines of architecture, interior architecture and urban design. Their responsibilities include the documentation of projects, project administration and site management.

Accreditation

The programme in Architecture is accredited by the South African Council for the Architectural Profession (SACAP), the Royal Institute of British Architects (RIBA) and the Commonwealth Association of Architects (CAA).

The degree in Architecture has offered me exciting opportunities to experiment with the substance and forms in which we dwell. I love the fact that the degree is interdisciplinary and incorporates fine arts to economics. I feel it is equipping me with the necessary skills and knowledge to contribute meaningfully to the built environment and to industry. Students in the Department of Architecture are encouraged to experiment and find an expression of their own passion, but academic development is also closely monitored.

We are encouraged to participate in national competitions and I was one of three students who were awarded the 2010 Murray and Roberts Des Baker Award. Exposure to industry takes place regularly through open lectures and graduates from the University of Pretoria are highly valued in industry. My dream job would be to open a design firm in partnership with some of the exciting people I've met during my studies.

Stephen Steyn
BSc(Interior Architecture)

Information on a career in interior architecture is available online at www.ifiworld.org

<table>
<thead>
<tr>
<th>Undergraduate (by coursework)</th>
<th>Minimum duration</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc(Int)</td>
<td>Three years (full-time, studio-based)</td>
<td>Candidate interior* (architectural technologist)</td>
</tr>
<tr>
<td>At least one year of work or travel recommended</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postgraduate (by coursework)</th>
<th>Minimum duration</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>BInt(Hons)</td>
<td>One year (full-time, studio-based)</td>
<td>Candidate interior designer*</td>
</tr>
<tr>
<td>MInt(Prof)</td>
<td>One year (full-time, studio-based)</td>
<td>Candidate interior architect*</td>
</tr>
</tbody>
</table>

*Although these categories for professional registration are not yet officially recognised in South Africa, the programme already complies with all requirements. For more information, see www.iidprofessions.com/

The BSc(Int) qualification enables graduates to register with the South African Council for the Architectural Profession (SACAP) as candidate architectural technologists. In practice, technologists and/or junior designers provide assistance in interior architecture, interior design and architecture. Their responsibilities include the documentation of projects, project administration and site management. The programme also enables graduates to access the related fields of product, exhibition, stage and lighting design.

Accreditation

The programme in interior architecture is one of only four similar programmes in South Africa that are accredited by the International Federation of Interior Architects and Designers (IFI).

BSc(Landscape Architecture)

Information on a career in landscape architecture is available online at www.ilasa.co.za

<table>
<thead>
<tr>
<th>Undergraduate (by coursework)</th>
<th>Minimum duration</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc(LArch)</td>
<td>Three years (full-time, studio-based)</td>
<td>Candidate landscape architectural technologist</td>
</tr>
<tr>
<td>At least one year of work or travel recommended</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postgraduate (by coursework)</th>
<th>Minimum duration</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL(Hons)</td>
<td>One year (full-time, studio-based)</td>
<td>Candidate landscape architect</td>
</tr>
<tr>
<td>ML(Prof)</td>
<td>One year (full-time, studio-based)</td>
<td></td>
</tr>
</tbody>
</table>

The BSc(LArch) qualification enables graduates to register with the South African Council for the Landscape Architectural Profession (SACLAP) as candidate landscape architectural technologists. 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 assessments and reports, the documentation of projects, project administration and site management.

Accreditation

The programme in landscape architecture is the only undergraduate degree course of its kind offered in South Africa and is accredited by the South African Council for the Landscape Architectural Profession (SACLAP). Although graduates of the programme practise in Europe, North America and Australia, most are employed locally, where there is 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 programmes offered by the Department as their second choice are not 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. 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 forthcoming departmental selection test. With the invitation, they also receive an assessment package to complete at home and submit on the day of the test. In Round 2, candidates are assessed on their general knowledge and interests, abilities, motivation and experience by means of the departmental selection test, taken on one of the pre-scheduled Saturdays in June, July, August and September. Candidates must then also submit the assessment package sent to them shortly after the foregoing selection process in Round 1.
The Department compiles a shortlist of final candidates based on the outcome of the tests and assessment packages. Those candidates whose names have made the shortlist are invited to participate in the final selection interviews during the September recess. The decision of the selection committee is final and no discussion or correspondence will be entered into.

While candidates should preferably attend their test and interview, 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 Department may be withheld.

**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 application directly to the Office for Student Administration, 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 are required) 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.

**Institutional Proficiency Test**

The Department of Architecture does not require all applicants to take the Institutional Proficiency Test. In special cases, the Admissions Officer will inform candidates of the arrangements, should the test be an additional requirement. Candidates who also apply at other departments or institutions are advised to enquire if these tests are required elsewhere. (More on p 36.)

**Incomplete applications**

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

**Open Day: Saturday, 21 May 2011**

The University of Pretoria hosts an annual Open Day on the Hatfield Campus. Prospective students are strongly advised to attend. Student work is on display and lecturers and advisors are available to answer questions. Two information sessions, at 09:00 and again at 11:00, will be presented in Auditorium 3-3, Boukunde (Building Sciences) Building on the University’s Hatfield Campus. (More on p 39.)

**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 in 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 are directed to the Client Service Centre or can be submitted electronically.

30 June: Last day for 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 Saturdays.

October recess: 1 October to 9 October 2011: Final selection interviews for applicants on the shortlist.

31 October: Selection results are available by the end of October. 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.

Contact details:

The Department of Architecture does not deal with the administrative aspects of student affairs, such as applications, tuition fees, bursaries, 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.

<table>
<thead>
<tr>
<th>General enquiries and applications: prospective students</th>
<th>Enquiries about applications and selection</th>
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<tbody>
<tr>
<td>Client Service Centre</td>
<td>Ms Jenny van Rooyen (Admissions Officer)</td>
</tr>
<tr>
<td>Tel: +27 (0) 12 420 3111</td>
<td>School for the Built Environment, Level 6 Engineering Building 1</td>
</tr>
<tr>
<td>E-mail: <a href="mailto:csc@up.ac.za">csc@up.ac.za</a></td>
<td>Tel: +27 (0) 12 420 5166</td>
</tr>
<tr>
<td></td>
<td>Fax: +27 (0) 12 420 4669</td>
</tr>
<tr>
<td></td>
<td>E-mail: <a href="mailto:jenny.vanrooyen@up.ac.za">jenny.vanrooyen@up.ac.za</a></td>
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</tbody>
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<tr>
<th>Academic enquiries: prospective students</th>
<th>Useful links</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr Nico Botes (Department of Architecture)</td>
<td>• University of Pretoria: <a href="http://www.up.ac.za">www.up.ac.za</a>. For a description of regulations, subject modules and syllabi, click the following link and select ‘Built Environment’: <a href="http://www.up.ac.za/yearbooks">www.up.ac.za/yearbooks</a></td>
</tr>
<tr>
<td>Tel: +27 (0) 12 420 4600</td>
<td>• The South African Council for the Architectural Profession (SACAP): <a href="http://www.sacapsa.com">www.sacapsa.com</a></td>
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<tr>
<td>Fax: +27 (0) 12 420 2552</td>
<td>• The South African Institute of Architects (SAIA): <a href="http://www.saia.org.za">www.saia.org.za</a></td>
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<tr>
<td>E-mail: <a href="mailto:arch@up.ac.za">arch@up.ac.za</a></td>
<td>• International Federation of Interior Architects/Designers (IFI): <a href="http://www.ifiworld.org">www.ifiworld.org</a></td>
</tr>
<tr>
<td>Location: Boukunde Building, University of Pretoria</td>
<td>• Institute of Landscape Architects of South Africa (ILASA): <a href="http://www.ilasa.co.za">www.ilasa.co.za</a></td>
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<td></td>
<td>• South African Council for the Landscape Architectural Profession (SACLAP): <a href="http://www.saclap.org.za">www.saclap.org.za</a></td>
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</tbody>
</table>

“My degrees in Quantity Surveying have opened many promising and rewarding doors for me. Tukkies students are sought after by the construction industry. I have made lifelong friends, forged unforgettable memories and have undoubtedly, built a secure foundation for my future, both professionally and personally!”

Stefan Potgieter
Honours graduate in BSc(QS)(Hons) and winner of the Joshua Pienaar trophy
Department of Construction Economics

BSc(Construction Management)

What does the discipline entail?

Construction managers are business people who work as contractors, project managers and/or property experts in the built environment. The discipline focuses on technical, financial and managerial aspects. 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 two-years honours programme 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 various 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. Registration is possible in the professional construction manager and professional construction project manager categories.

On successful completion of the three-year degree, students could enter a career in construction management or subcontract and main contract work, to mention a few possibilities. On successful completion of the two-year honours programme, 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 degree take to complete?

The BSc(Construction Management) programme takes three years to complete, and the honours programme a further two years. During the honours programme, students are expected to work at an approved construction firm 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 degree 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 discipline. Practitioners and employers rate UP students highly, and there is continuous close liaison between the Department and industry.

Contact details:
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(Programme Leader: Construction Management)
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The built environment offers endless opportunities to those fortunate enough to be involved in this exciting field, from architectural history to property law. Lecturers take a genuine interest in our progress. I was invited to become a member of the Golden Key International Honours Society and I won the Schindler Lifts Prize 2009, for best student in Building Services, the second-best first-year student in 2008 and the second-best second-year student in 2009. I have a full bursary from Group 5 and won achievement awards from the University for an average above 75% in both 2008 and 2009.

Danielle le Plastrier
First year

<table>
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<tr>
<th>First semester</th>
<th>Second semester</th>
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<tbody>
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<td>• Building Drawings</td>
<td>• Industrial and Organisational Psychology</td>
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<td>• Building Science</td>
<td>• Building Organisation</td>
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<td>• Introduction to Structures</td>
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<td>• Precalculus</td>
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Second year

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<tr>
<td>• Labour Law</td>
<td>• Building Science</td>
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<td>• Building Science</td>
<td>• Economics</td>
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<td>• Construction Quantities</td>
<td>• Construction Management</td>
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<td>• Reinforced Concrete Structures</td>
<td>• History of the Environment</td>
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<td>• Site Surveying</td>
<td>• Civil Engineering Services</td>
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Third year

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<td>• Building Science</td>
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<td>• Building Services</td>
<td>• Introduction to Property Law</td>
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<td>• Construction Management</td>
<td>• Building Services</td>
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<td>Construction Information</td>
<td>• Construction Management</td>
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<tr>
<td>Communication Technology and</td>
<td>• Construction Quantities</td>
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<tr>
<td>Communication</td>
<td>• Community-based Project</td>
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BSc(Quantity Surveying)

What does the discipline 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, the architect, consulting engineers and the contractor 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 become employees in quantity surveying practices or, after registration with the South African Council for the Quantity Surveying Profession, perhaps partners/directors, or they can start their own professional practices. Quantity surveyors also act as project managers. Various government departments employ quantity surveyors, and opportunities in the property sector, banking and manufacturing industries are further possibilities. A number of quantity surveyors, however, also work for construction firms or establish their own building enterprises and construction companies.

How long does this degree take to complete?

Three-year BSc(Quantity Surveying): After three years of successful study, students receive a BSc(Quantity Surveying) 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.

Two-year BSc(Hons) Quantity Surveying: After a further two years of successful study, students will receive a BSc(Hons) Quantity Surveying 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 examinations, register with the South African Council for the Quantity Surveying Profession. During the honours years, students are expected, when not attending lectures, to work at an approved quantity surveying firm 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.

What fun-filled years these have been as I learnt about life and people! The Welcoming Day Programme was an amazing introduction to this University and inspired me to do my best. Currently, I am an honours student in Quantity Surveying. I have gained a vast amount of knowledge about the construction industry at Tuks. I realise that I will continually have to develop and sustain my knowledge in order to stay competitive in an ever-changing building environment. I won Association of South African Quantity Surveyors (ASAQS) prizes every year of my undergraduate studies; and a prize for best student in the subject Quantities. In my second year, I received the John Bell Prize for best Quantity Surveying student overall. I am very grateful for the ASAQS bursary I received in my fourth year. I dream of managing a large construction company one day.

Linde Lieske
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 details:
Mr Danie Hoffman
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BSc(Real Estate)

What does the discipline 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.

“... My degree has expanded my horizons and I believe the sky is the limit! This course helps one to become independent and teaches one to think on one’s feet. I have had plenty of opportunities to discover my inherent abilities and to develop to my full potential. I was nominated for the DJ Liang prize in both 2008 and 2009 and received a study incentive from Nedbank from 2006 to 2010. Doing my honours in Quantity Surveying at UP will enable me to travel the world and discover places I have never seen before. “

Corné van Staden

Faculty of Engineering, Built Environment and Information Technology
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 degree take to complete?

After three years of successful study, students receive a BSc(Real Estate) degree.

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, development of low-cost housing, etc.). The degree also offers ample opportunity for community service and research.

The number of persons working in the various components of the property industry in South Africa runs into the 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 details:

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Fax: +27 (0)12 420 3598
E-mail: chris.cloete@up.ac.za

| First year                                                                 |
| First semester                                                              | Second semester                                         |
| • Building Drawings                                                        | • Industrial and Organisational Psychology              |
| • Building Science                                                         | • Building Organisation                                 |
| • Computer Literacy                                                        | • Building Drawings                                     |
| • Academic Literacy                                                        | • Building Science                                      |
| • Building Services                                                        | • Information Literacy                                  |
| • Quantities                                                               | • Academic Literacy                                      |
| • Introduction to Structures                                               | • Building Services                                     |
| • Statistics                                                              | • Quantities                                            |
| • Precalculus                                                             | • History of the Environment                            |
|                                                                         | • Structures                                            |
|                                                                         | • Statistics                                            |

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

Department of Town and Regional Planning

B Town and Regional Planning

What does the discipline 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 building-site level to supranational level and aim at widening choice, promoting equity, ensuring sustainable human settlements and improving the quality of people’s lives. Among others, 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 a graduate to register as a professional town and regional planner 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 degree 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. A number of modules in related fields is also prescribed to ensure the multidisciplinary perspective and knowledge base required to provide appropriate solutions for complex urban and rural problems.

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 course 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.

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

<table>
<thead>
<tr>
<th>First year</th>
<th>Second semester</th>
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<tbody>
<tr>
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<td>Academic Literacy</td>
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<tr>
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<td>Transport Planning</td>
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<td>Metropolitan, District and Local Spatial Planning</td>
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<td>Methods of Critical Thinking and Research</td>
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</table>
This exciting programme is the first of its kind in South Africa and integrates, in a four-year programme, the different disciplines related to information technology (IT). Many people have a desire to be professionally prepared for a career in the IT industry, rather than becoming an expert in a particular discipline. The School therefore designed the programme with the explicit aim of ensuring that students have a grounding in all aspects deemed to be a necessary part of the background of the IT professional. The fourth and final year thus 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 prerequisites are correspondingly higher than for most of the other programmes in the School. On successful completion, BIT graduates can continue with the part-time MIT programme or any other master's degree in the School of Information Technology and round off his or her professional training.

What does the discipline entail?

The course prepares students to understand the use of IT in organisations. In particular, skills are developed to program on both a small and a 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 course. 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 the student to the working world, and ensures his or her smooth transition to a professional work life after graduation.

Career opportunities

The goal of the degree is to prepare a well-rounded information technologist who has a knowledge and understanding of the following:
- Theory and practice of programming and software engineering
- 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 degree take to complete?

The BIT degree takes a minimum of four years to complete.

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Computer Science
- Programming and Advanced Programming
- Networks
- Computer Architecture
- Software Engineering
- Data Structures and Algorithms
- Operating Systems

Informatics
- Programming
- System Development
- Databases

Computer Science Other
- Linear Algebra
- Calculus
- Discrete Structures
- Philosophy
- English
- Financial Accounting
- Business Management
- Business Law
- Community-based Project

Informatics Information Science
- Information Organisation and Retrieval
- Multimedia

The community project I did for the Lowveld SPCA stands out as a precious experience as it improved my life skills and I felt that I was making a difference. So too, my relationship-building has increased as a tutor in Department of Computer Science. I won a UP bursary in my second year and I also won a CSIR bursary as a top achiever in my third year. I dream of being a really good software engineer for a major software company.

Heloise Pieterse

Faculty of Engineering, Built Environment and Information Technology

School of Information Technology

Department of Information Technology

B Information Technology

This programme is the first of its kind in South Africa and integrates, in a four-year programme, the different disciplines related to information technology (IT). Many people have a desire to be professionally prepared for a career in the IT industry, rather than becoming an expert in a particular discipline. The School therefore designed the programme with the explicit aim of ensuring that students have a grounding in all aspects deemed to be a necessary part of the background of the IT professional. The fourth and final year thus 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 prerequisites are correspondingly higher than for most of the other programmes in the School. On successful completion, BIT graduates can continue with the part-time MIT programme or any other master's degree in the School of Information Technology and round off his or her professional training.

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Department of Informatics

BCom(Informatics)

What does the discipline entail?

BCom(Informatics) could be the start to an exciting career that will keep you in touch with modern information technology on an ongoing basis. The world of the business person is enhanced, since this technology enables one to do more in less time. Information technology is also the gateway to the international systems business scene where transactions are concluded within seconds instead of weeks, as was the case previously. The degree gives students an opportunity to learn about information systems in an organisation, the analysis, design, and implementation of information systems in organisations, programming, the design and administration of database systems, systems architecture, electronic commerce, data mining and data warehousing. BCom(Informatics) is the only informatics degree in South Africa that is internationally accredited by the Accreditation Board for Engineering and Technology (ABET) of the USA.

Career opportunities

Informaticians are often known by other names, such as systems analysts, system developers, business analysts and information facilitators.

Information in this publication

Due to the annual adjustments of the programmes offered by the Faculty, which are regularly reviewed, some of the information in this publication may not fully reflect the most recent developments in the Faculty. Prospective students must make use of the Faculty Yearbook, which is handed out during registration, to compile their final programme.

Contact details:
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First year

<table>
<thead>
<tr>
<th>First year</th>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compulsory modules</td>
<td>• Computer and Information Literacy</td>
<td>Elective modules (Choose one*)</td>
</tr>
<tr>
<td></td>
<td>• Academic Literacy</td>
<td>• Marketing Management</td>
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<tr>
<td></td>
<td>• Informatics</td>
<td>• Industrial and Organisational Psychology</td>
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<td>• Financial Accounting</td>
<td>• Public Administration</td>
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<td>• Economics</td>
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<td>• Statistics</td>
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<td></td>
<td>• Communication Management</td>
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<td>• English</td>
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<td>• Business Management</td>
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<td>• Discrete Structures</td>
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Second year

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<th>Second year</th>
<th>First semester</th>
<th>Second semester</th>
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<tbody>
<tr>
<td>Compulsory modules</td>
<td>• Business Ethics</td>
<td>Elective modules (Choose one)</td>
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<tr>
<td></td>
<td>• Informatics</td>
<td>• Business Management</td>
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<td></td>
<td>• Business Law</td>
<td>• Financial Accounting</td>
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<td></td>
<td>• Community-based Project</td>
<td>• Taxation</td>
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<td>• Statistics</td>
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<td>• Internal Auditing</td>
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<td>• Industrial and Organisational Psychology</td>
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<td>• Public Administration</td>
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<td>• Community-based Project</td>
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Third year

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<tr>
<th>Third year</th>
<th>First semester</th>
<th>Second semester</th>
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<tbody>
<tr>
<td>Compulsory module</td>
<td>• Informatics</td>
<td>Elective modules (Choose one)</td>
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<td>• Business Management</td>
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<td>• Industrial and Organisational Psychology</td>
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<td>• Public Administration</td>
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</table>

"The EBIT Faculty is an open gateway to creativity and innovation! My degree is an adventure and therefore challenging, but as a practical, analytical and critical person, I am working hard and focusing on the bigger picture. The JCP module which involves community engagement projects, is remarkable and has honed my communication skills, leadership abilities, teamworking and interpersonal skills, which are crucial in the corporate environment. I received the award for best third-year experimental project in Information Science, and was pleased with my award for the best Pumascope Project by the Department of Computer Science."

Nkateko Nikiwe
Department of Computer Science

BSc(Computer Science)

BSc(Computer Science) is the ideal degree 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. It gives them a foundation for continued learning in an IT career and for producing high-quality software.

What does the discipline 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 programme includes a significant number of courses in mathematics. These courses strengthen the kind of thinking done when one develops software and 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.

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Undergraduate Advisor
Ms L Marshall
E-mail: lmarshall@cs.up.ac.za

School of Information Technology

BSc(IT) Information and Knowledge Systems

BSc(IT) Information and Knowledge Systems is the ideal degree for students who are interested in the field of Computer Science, as well as in one of the following fields: Applied Mathematics, Bioinformatics, Geographical Information Systems, IT and Enterprises, IT and Law, IT and Music, Philosophy, Operational Research, Psychology and Software Development.

Candidates who do not comply with the admission requirements are advised to register for the BSc(IT) four-year programme if they meet the admission requirements of that programme.
What does the discipline entail?

The BSc(IT) Information and Knowledge Systems degree 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 BSc(IT) Information and Knowledge Systems degree is reflected in the composition of the curriculum by combining the field of computer science with other fields.

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 better satisfy the needs of industry. The application environments that students can choose from provide them with a wider range of job opportunities.

The following are some career possibilities:

- **Applied Mathematics**: computational financial modelling, financial data mining and analysis, financial programming, numerical and risk analysis
- **Bioinformatics**: bioprogramming, biotechnology, administration of biological data
- **Geographical Information Systems (GIS)**: GIS consultation, environmental analysis for national, provincial and municipal governments, 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, forensic investigations
- **IT and Music**: electronic music analysis, programming of music devices and drivers, digital storytelling and advertising
- **Operational Research**: mathematical modelling and optimisation, numerical and empirical analysis
- **Philosophy**: computer ethics, professional responsibility, potential for computer science research
- **Psychology**: forensic psychology, profiling, expert testimony in court cases, behavioural analysis
- **Software Development**: database design and development, human-computer interface design, programming in many environments

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Ms L Marshall (Undergraduate Advisor)
E-mail: lmarshall@cs.up.ac.za

<table>
<thead>
<tr>
<th>First year</th>
<th>First semester</th>
<th>Second semester</th>
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</thead>
<tbody>
<tr>
<td>Computer Science</td>
<td>• Program Design and Development</td>
<td>Mathematics</td>
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<tr>
<td></td>
<td>• Computers and Algorithms</td>
<td>• Calculus</td>
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<td></td>
<td>• Software Modelling</td>
<td>• Discrete Structures</td>
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<td></td>
<td>• Computer Architecture</td>
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<table>
<thead>
<tr>
<th>Second year</th>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science</td>
<td>• Data Structures and Algorithms</td>
<td>Mathematics</td>
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<td></td>
<td>• Netcentric Computer Systems</td>
<td>• Discrete Structures</td>
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<tr>
<td></td>
<td>• Operating Systems</td>
<td>• Informatics and Information Science</td>
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<td></td>
<td>• Concurrent Systems</td>
<td>• Community-based Project</td>
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<td>• Community-based Project</td>
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<thead>
<tr>
<th>Third year</th>
<th>First semester</th>
<th>Second semester</th>
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<tbody>
<tr>
<td>Computer Science</td>
<td>• Software Engineering</td>
<td>Information Science</td>
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<td></td>
<td>• Computer Security and Ethics</td>
<td>• Human-computer Interaction</td>
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<td>• Computer Networks</td>
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<td></td>
<td>• Programming Languages</td>
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</table>

Additional modules as needed for the application environment options at first-, second- and third-year levels from one of the following fields:

- Applied Mathematics
- Bioinformatics, Geographical Information Systems
- IT and Enterprises
- IT and Law
- IT and Music
- Operational Research
- Philosophy
- Psychology
- Software Development

**BSc(IT) Information and Knowledge Systems (Four Year Programme)**

This is the ideal degree for students who are interested in either BSc(IT) Information and Knowledge Systems or BSc(Computer Science), but who do not meet the requirements for admission.

"My undergraduate degree provided a platform that has prepared me for the challenges of the working world. I learnt to solve problems and think strategically. In 2009, I won the Microsoft prize for the best female third-year student in computer science and I work part-time at Epiluse Labs as a junior developer. My dream job would be to work for Google!"

---

Carina Viljoen
What does the discipline entail?

The BSc(IT) Information and Knowledge Systems (Four Year Programme) can be completed in a minimum of four years. The degree comprises much of the fundamental content of both the BSc(Computer Science) and BSc(IT) Information and Knowledge Systems degrees.

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Ms L Marshall (Undergraduate Advisor)
E-mail: lmarshall@cs.up.ac.za

First year
First semester | Second semester
--- | ---
Computer Science | Mathematics
  • Program Design and Development | • Calculus
  • Computers and Algorithms | • Information Technology
  • Computer Architecture | Orientation

Second year
First semester | Second semester
--- | ---
Computer Science | Mathematics
  • Software Modelling | • Calculus
  • Operating Systems | • Information Technology
  • Program Design and Development | • Information Science
  • Community-based Project | • Statistics

Third year
First semester | Second semester
--- | ---
Computer Science | Informatics
  • Concurrent Systems | • Information Science
  • Data Structures and Algorithms | • Mathematics
  • Netcentric Computer Systems | • Discrete Structures

Fourth year
First semester | Second semester
--- | ---
Computer Science | Informatics
  • Software Engineering | • Information Science
  • Programming Languages | • Human-computer Interaction
  • Database Systems |
  • Computer Security and Ethics |
  • Computer Networks |

Department of Information Science

BIS(Multimedia)

BIS(Multimedia) is the ideal degree for students who like to work with a computer, like programming, are interested in creating computer games, want to develop websites for the corporate environment, and want to learn how to make moving graphics and animation.

What does the discipline 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 (such as the web and its many devices, ranging from personal computers to cellphones and personal assistants) to information kiosks based on CD-ROM or DVD technology. 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 convergence of many traditional communication media, such as paper publications, television, radio, phone technologies and 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) degree prepares graduates to get a job with any of these dynamic content producers.

They could also become hard-core coders and work for a programming company, 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 service providers; in fact, at any institution that communicates information in multimedia.

A candidate who does not comply with the admission requirements for the BIS(Multimedia) degree is advised to apply for admission to the BIS(Multimedia)(Four Year Programme). The BIS(Multimedia) degree takes a minimum of three years to complete.

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Website: http://is.up.ac.za

First year
First semester | Second semester
--- | ---
Fundamental modules | Fundamental modules
  • Computer Literacy | • Information Literacy
  • Academic Literacy / Communication in Organisations
  • Academic Writing Skills
  • Information Science
  • Human-computer Interaction

Core modules

Information Science
  • Introduction to Information Science

Multimedia
  • Mark-up Languages

Computer Science
  • Imperative Programming
  • Introduction to Computer Science

Other compulsory modules
  • Visual Design

First year
First semester | Second semester
--- | ---
Fundamental modules | Fundamental modules
  • Computer Literacy | • Information Literacy
  • Academic Literacy / Communication in Organisations

Core modules

Information Science
  • Organisation and Representation of Information
  • Information and Communication Technology

Multimedia
  • Multimedia for the Web

Computer Science
  • Introduction to Program Design
  • Software Modelling

Other compulsory modules
  • Visual Design
  • Computer Architecture
Second year  
First semester  Second semester

**Fundamental module**
- Community-based Project

**Core modules**

**Multimedia**
- Advanced Mark-up Languages I
- Multimedia and Hypermedia Theory

**Publishing**
- Copy-editing

**Computer Science**
- Data Structures and Algorithms
- Netcentric Computer Systems

**Other compulsory module**
- Visual Design

---

Third year  
First semester  Second semester

**Core modules**

**Multimedia**
- Multimedia Project
- Human-computer Interaction

**Computer Science**
- Introduction to Programming – continuation

**Mathematics**
- Calculus

**Other compulsory module**
- Visual Design

---

**BiS(Multimedia)**  
(Four Year Programme)

A candidate who does not comply with the admission requirements for the BiS(Multimedia) degree, is advised to apply for admission to the BiS(Multimedia) four-year programme.

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---

First year  
First semester  Second semester

**Fundamental module**
- Computer Literacy
- Academic Literacy/Academic Writing Skills

**Core modules**

**Information Science**
- Introduction to Information Science

**Computer Science**
- Introduction to Computer Science
- Introduction to Programming

**Information Technology**
- Information Technology Orientation

**Mathematics**
- Precalculus

---

Second year  
First semester  Second semester

**Core modules**

**Multimedia**
- Multimedia for the Web

**Computer Science**
- Software Modelling
- Operating Systems

**Mathematics**
- Calculus

---

Third year  
First semester  Second semester

**Fundamental module**
- Community-based Project

**Core modules**

**Multimedia**
- Advanced Mark-up Languages I
- Multimedia and Hypermedia Theory

**Publishing**
- Copy-editing

**Computer Science**
- Data Structures and Algorithms
- Netcentric Computer Systems

**Other compulsory module**
- Visual Design
Faculty of Engineering, Built Environment and Information Technology

### Fourth year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
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<tbody>
<tr>
<td>Core modules</td>
<td>Computer Science</td>
</tr>
<tr>
<td>Multimedia</td>
<td>Select at least two of the following:</td>
</tr>
<tr>
<td>• Multimedia Project</td>
<td>• Software Engineering</td>
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<tr>
<td>• Human-computer Interaction</td>
<td>• Artificial Intelligence</td>
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<tr>
<td>• Trends</td>
<td>• Computer Networks</td>
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<tr>
<td>• Computer Security and Ethics</td>
<td>• Programming Languages</td>
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<td>• Computer Graphics</td>
<td>• Compiler Construction</td>
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<td>• Database Systems</td>
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<tr>
<td>*The semester in which the modules are offered may vary from year to year. Students need to elect at least two COS modules in total for the year.</td>
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</tbody>
</table>

### BIS(Information Science)

**BIS(Information Science)** is the ideal degree 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 discipline 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 package 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. Two or three specialisation options are available, depending on the electives chosen.

### Career opportunities

- Information manager (manages information and knowledge resources)
- Information specialist (organises, retrieves and adds value to information)
- Information consultant (consults on information products, services and systems)
- Information broker (acts as an infopreneur and buys and sells information products and services)
- Systems specialist (develops and analyses information systems)

### How long does this degree take to complete?

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

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---

"I liked the exposure to practices that are up-to-date and relevant in industry. The modules offered in information science are diverse and offer practical skill application opportunities. While studying, I’ve been offered several jobs, but my dream is to be self-employed and focus on the development of creative projects. I received the award for top first- and second-year BIS(Multimedia) student and also the award for top second-year BSc(Computer Science) student."
First year

First semester  Second semester

Fundamental modules  Fundamental modules
  • Computer Literacy  • Information Literacy
  • Academic Literacy  • Academic Literacy

Core modules  Core modules

Information Science  Information Science
  • Introduction to Information Science  • Organisation and Representation of Information
  • Personal Information Management  • Information and Communication Technology

Business Management  Business Management

Elective modules  Elective modules
  • Group A: Informatics*  • Group A: Informatics*
  • Group B: Any subject(s) at first-year level  • Group B: Any subject(s) at first-year level

Second year

First semester  Second semester

Fundamental module  Fundamental module
  • Community-based Project  • Community-based Project

Core modules  Core modules

Information Science  Information Science
  • Information Seeking and Retrieval  • Representation and Organisation
  • Social and Ethical Impact  

Business Management or Communication Management  

Elective modules  Elective modules
  • Group A: Informatics*  • Group A: Informatics*
  • Group B: Information Science  • Group B: Information Science

Third year

First semester  Second semester

Core modules  Core modules

Information Science  Information Science
  • Information Organisation  • Information and Knowledge Management
  • Experimental Learning Project  • Experimental Learning Project

Elective modules  Elective modules
  • Group A: *Informatics and Business Management or Communication Management  • Group A: *Informatics and Business Management or Communication Management
  • Group B: Information Science  • Group B: Information Science
  • Group C: *Informatics and Information Science  • Group C: *Informatics and Information Science

*If Informatics is selected as a subject at first-year level, an achievement rating of 4 (50–59%) must be obtained for Mathematics

BIS(Publishing)

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

What does the discipline entail?

This course aims to:
  • 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 to become responsible information intermediaries and to add value to the production and dissemination of books and corporate publications; and
  • 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 a specific role-player in the publishing value chain (for example, the managing director of a publishing house, commissioning editor, 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 initiatives
  • Self-publishing and consultancy

How long does this degree take to complete?

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

Contact details:
Prof Theo Bothma (Head of Department)
Tel: +27 (0)12 420 2961
Fax: +27 (0)12 362 5181
E-mail:infosci@up.ac.za
Website:http://is.up.ac.za
General information

All general enquiries can be directed to the Client Service Centre
Tel: +27 (0)12 420 3111
E-mail: csc@up.ac.za
Website: www.up.ac.za
Parents’ Page: www.up.ac.za/parents

Postal address
University of Pretoria, Private Bag X20, Hatfield, 0028

Street address
University of Pretoria, cnr Lynnwood Road and Roper Street, Hatfield, 0083

GPS coordinates for our campuses
Hatfield Campus: S25° 45' 21" E28° 13' 51"
LC de Villiers: S25° 45' 10" E28° 14' 46"
Groenkloof: S25° 46' 10" E28° 12' 34"
Onderstepoort: S28° 10' 54" E25° 38' 52"
Mamelodi: S25° 43' 22" E28° 23' 56"
Prinshof: S25° 43' 57" E28° 12' 10"
GIBS: S26° 07' 46" E28° 02' 46"

Faculty Administration Offices
6th floor, Engineering I Building, Hatfield Campus.

University of Pretoria banking details

<table>
<thead>
<tr>
<th>Bank</th>
<th>Branch</th>
<th>Branch code</th>
<th>Account Number</th>
<th>Swift code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSA</td>
<td>Hatfield</td>
<td>632005</td>
<td>214 000 0054</td>
<td>ABSAZAJJ</td>
</tr>
<tr>
<td>Standard Bank</td>
<td>Hatfield</td>
<td>011545</td>
<td>012 602 604</td>
<td>SBZAZAJ</td>
</tr>
</tbody>
</table>

Institutional Proficiency Test

The University of Pretoria requires prospective students to write the Institutional Proficiency Test in the year prior to entry. This test provides additional information about a student’s performance in three core domain areas, i.e. Academic Literacy and Quantitative Literacy (AQL) (one three-hour test), as well as Mathematics (one three-hour test). The Mathematics Test is also known as the Cognitive Mathematical Proficiency (CAMP) Test and tests a learner’s ability related to mathematical concepts in the National Senior Certificate (NSC) Mathematics Paper I and II. Prospective students write two tests, but obtain three scores.

Rules

1. Information on the test will be included in the application letter sent to students.
2. Applicants are permitted to write the test twice.
3. The test is valid for applications to all South African universities.
4. Results will be available online to both the student and the university (or universities) to which they have applied.
5. Institutional access will be password protected.
6. An administration fee of R10 per AQL test date plus R50 per test is payable via EasyPay. If you write both the AQL and the Mathematics Test, you will pay R110.
7. Learners register online at www.nbt.ac.za and choose their own date and venue.
8. You write using your ID number.

First year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundamental modules</td>
<td>Fundamental modules</td>
</tr>
<tr>
<td>• Computer Literacy</td>
<td>• Information Literacy</td>
</tr>
<tr>
<td>• Academic Literacy</td>
<td>• Academic Literacy</td>
</tr>
<tr>
<td>• Visual Communication</td>
<td>• English for specific purposes</td>
</tr>
<tr>
<td>Core modules</td>
<td>Core modules</td>
</tr>
<tr>
<td>Information Science</td>
<td>Information Science</td>
</tr>
<tr>
<td>• Introduction to Information Science</td>
<td>• Information and Communication Technology</td>
</tr>
<tr>
<td>• Personal Information Management</td>
<td>Publishing</td>
</tr>
<tr>
<td></td>
<td>• The Book Publishing Environment</td>
</tr>
<tr>
<td></td>
<td>Introduction to Design History</td>
</tr>
<tr>
<td>Marketing</td>
<td>Marketing</td>
</tr>
<tr>
<td>Elective modules</td>
<td>Elective modules</td>
</tr>
<tr>
<td>• Select a modern language of your choice in consultation with the package organiser</td>
<td>• Select a modern language of your choice in consultation with the package organiser</td>
</tr>
</tbody>
</table>

Second year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundamental module</td>
<td>Fundamental module</td>
</tr>
<tr>
<td>• Community-based Project</td>
<td>• Community-based Project</td>
</tr>
<tr>
<td>Core module</td>
<td>Core module</td>
</tr>
<tr>
<td>Information Science</td>
<td>Information Science</td>
</tr>
<tr>
<td>• Social and Ethical Impact</td>
<td>• The Visual and Production Dimensions of Publishing</td>
</tr>
<tr>
<td>Publishing</td>
<td>Publishing</td>
</tr>
<tr>
<td>• Copy-editing</td>
<td>Text Design</td>
</tr>
<tr>
<td>Visual Communication</td>
<td>Elective modules</td>
</tr>
<tr>
<td></td>
<td>Continue with the same language as selected previously and select modules in consultation with the package organiser</td>
</tr>
</tbody>
</table>

Third year

<table>
<thead>
<tr>
<th>First semester</th>
<th>Second semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core modules</td>
<td>Core modules</td>
</tr>
<tr>
<td>Publishing</td>
<td>Publishing</td>
</tr>
<tr>
<td>• Publishing in the Digital Environment</td>
<td>• Management in the Publishing Environment</td>
</tr>
<tr>
<td>• Commissioning</td>
<td>• Publishing in the Magazine and Corporate Environment</td>
</tr>
<tr>
<td>Elective module</td>
<td>Elective module</td>
</tr>
<tr>
<td></td>
<td>Continue with the same language as selected previously and select one module in consultation with the package organiser. It can be a first or second semester module.</td>
</tr>
</tbody>
</table>

Faculty of Engineering, Built Environment and Information Technology
(9) Results will be available one month after the test date.
(10) NB. You are not permitted to use a scientific calculator during the Mathematics Test.
(11) At UP, learners applying for degrees where Mathematics is a requirement will write the AQL plus the Mathematics Test.

On the day on which the Institutional Proficiency Test is written, students must report to the venue at 07:30. Bring your identity document, your student number and your own stationery. Students have to pay via EasyPay before going to the test venue. Please bring your proof of payment with you. Please consult the following website for more information: www.nbt.ac.za or Tel: +27 (0)21 5323.

Application

Anyone who wishes to register at the University of Pretoria for the first time, or after a break in their studies, should apply or reapply for admission.

New students may only register after successful admission. If provisionally admitted, you will still have to comply with the requirements of the faculty in which you want to register with your final Grade 12 examination results. Thus, new students will only be permitted to register once their application is completed and admission processes are approved. Provisional admission is based on the results obtained in the final Grade 11 examination. Please take note that the final Grade 12 results remain the determining factor with regard to admission.

Furthermore, please note that the achievement of the minimum requirements does not necessarily guarantee admission to any programme or field of study.

Late applications: Before you submit a late application, please contact the Faculty Administration consultant to ensure that there is still space available. If the field of study is not subject to selection and if the Faculty still has space available, your application will be considered. Late applications are only accepted on condition that all the admission requirements for the relevant degrees are fully complied with. Should you not comply with the requirements, your application will not be accepted. Application fees will not be refunded. A Grade 12 certificate with university exemption (endorsement) is required if Grade 12 was obtained before 2008.

Admission

In order for prospective students with an NSC qualification to gain admission to any of the nine faculties at the University of Pretoria, applicants should comply with the following admission requirements:

(1) The minimum statutory and institutional requirements for degree studies
(2) Recognised and appropriate combinations of subjects
(3) The required APS as stipulated in the regulations and syllabi of each faculty
(4) English and/or Afrikaans at Grade 12 level.

The calculation of the Admission Point Score (APS) is based on a candidate's achievement in six recognised 20-credit subjects by using the seven-point NSC-rating scale. Life Orientation is excluded from the calculation of the APS.

### Language Policy and Medium of Instruction

With regard to the medium of instruction, the University uses two official languages, namely English and Afrikaans. In formal teaching, 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 all other levels of the module are presented. In terms of administration and other services, students themselves choose which language they would prefer to receive communications from the University (i.e. in either English or Afrikaans).

### Compulsory Academic Literacy Test for Registered First-Year Students

A student with high academic potential can have a low level of academic literacy, which may put his or her academic success at risk. The academic literacy levels of all new first-year students at the University of Pretoria are therefore measured by means of the standardised Academic Literacy Test. If necessary, students are placed on a suitable academic literacy programme in accordance with their level of risk.

The Academic Literacy Test is written only once and is compulsory for all new first-year students, regardless of whether the student has already written an admission test or has completed a language course elsewhere. If the student later decides to change his or her academic programme, the Academic Literacy Test does not need to be written again.
Bursaries and loans

New undergraduates who enrol for degree courses should obtain the minimum average indicated below in order to be eligible for a merit bursary.

New undergraduate achievement bursary values: 2011

<table>
<thead>
<tr>
<th>Faculty/School</th>
<th>Faculty of Natural and Agricultural Sciences</th>
<th>School for the Built Environment and School of Engineering</th>
<th>School of Information Technology</th>
<th>Other faculties and schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualifying average percentage</td>
<td>75-100%</td>
<td>75-100%</td>
<td>80-100%</td>
<td>80-100%</td>
</tr>
<tr>
<td>Minimum bursary value</td>
<td>R10 500</td>
<td>R10 500</td>
<td>R10 500</td>
<td>R7 100</td>
</tr>
<tr>
<td>Maximum bursary value</td>
<td>R24 500</td>
<td>R24 500</td>
<td>R21 000</td>
<td>R18 800</td>
</tr>
</tbody>
</table>

Closing date: 31 October
Website: www.up.ac.za/fao

Bursaries in 2011 for achievement in other academic fields and extra-curricular activities

<table>
<thead>
<tr>
<th>Category</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneurial</td>
<td>R2 200</td>
</tr>
<tr>
<td>Expo Gold Medalist</td>
<td>R2 200</td>
</tr>
<tr>
<td>Leadership – minimum</td>
<td>R600</td>
</tr>
<tr>
<td>Leadership – maximum</td>
<td>R2 200</td>
</tr>
<tr>
<td>Subject Olympiads – overall winner</td>
<td>R5 900</td>
</tr>
<tr>
<td>Subject Olympiads – 2nd to 10th place</td>
<td>R2 200</td>
</tr>
<tr>
<td>Science/Mathematics – overall winner</td>
<td>R3 800</td>
</tr>
<tr>
<td>Science/Mathematics – 2nd place</td>
<td>R24 600</td>
</tr>
<tr>
<td>Science/Mathematics – 3rd place</td>
<td>R18 500</td>
</tr>
<tr>
<td>Science/Mathematics – 4th to 10th place</td>
<td>R2 200</td>
</tr>
</tbody>
</table>

For further information on any of the above scholarships and loans, consult the University’s Study Financing brochure.

Tuition and other fees

The estimated tuition fee structure for 2011 in the Faculty of Engineering, Built Environment and Information Technology in the following schools is:

- School of Engineering: R28 500–R33 000
- School for the Built Environment: R23 730–R28 000
- School of Information Technology: R24 350–R36 520

This amount is subject to change and should not be considered to be the final cost. Prospective students are advised to adjust these amounts for inflationary increases in costs. The rate of inflation during 2011 can be used as a guideline to estimate the increase in tuition fees for 2012.

Levy | Payment required                                      | Payment date                                      | Amount  |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad hoc levies</td>
<td>Application levy (non-refundable)</td>
<td>Payable in the year preceding study</td>
<td>R220</td>
</tr>
<tr>
<td></td>
<td>International administrative levy</td>
<td>Payable prior to or during registration</td>
<td>R 2 000</td>
</tr>
<tr>
<td>Levies payable to secure study and/or residence place</td>
<td>Payment equal to the first instalment applicable to the place allocated:</td>
<td>Payable once notice has been given of placement during the year prior to study:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Study place</td>
<td>Study place</td>
<td>R3 200</td>
</tr>
<tr>
<td></td>
<td>Residence place</td>
<td>Residence place</td>
<td>R3 600</td>
</tr>
<tr>
<td>Cancellation levies</td>
<td>Should a study and/or residence place, which has been accepted, not be taken up, a cancellation levy is applicable.</td>
<td>Levy will be deducted from the abovementioned acceptance payment:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Study place</td>
<td>Study place</td>
<td>R1 600</td>
</tr>
<tr>
<td></td>
<td>Residence place</td>
<td>Residence place</td>
<td>R1 800</td>
</tr>
<tr>
<td>Initial payment (i.e. first instalment)</td>
<td>Tuition fees</td>
<td>Payable before or during registration</td>
<td>R2 250</td>
</tr>
<tr>
<td></td>
<td>Postgraduate students renewing registration</td>
<td></td>
<td>R3 200</td>
</tr>
<tr>
<td></td>
<td>All other students (under- and postgraduate)</td>
<td></td>
<td>R3 600</td>
</tr>
<tr>
<td></td>
<td>Residence fees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second instalment</td>
<td>50% of tuition fee account</td>
<td>On or before 30 April</td>
<td></td>
</tr>
<tr>
<td>Third instalment</td>
<td>100% of tuition fee account</td>
<td>On or before 31 July</td>
<td></td>
</tr>
</tbody>
</table>
General Information

Accommodation Hatfield Campus

Ladies’ residences: Asterhof, Erika, Jasmin, Katjiepeering, Madelief, Klaradyn, Magnetjie and Nerina
• Single rooms: R19 500
• Double rooms: R17 900
• Should 100% of meals be taken: R25 400

Ladies’ residence: Nerina (new single)
• Single rooms: R21 900
• Should 100% of meals be taken: R25 400

Men’s residences: Boekenhout, Kollege, Maroela, Mopanie, Olienhout and Taibbos
• Single rooms: R19 500
• Double rooms: R17 900
• Should 100% of meals be taken: R25 400

Tuks Village: Units for ladies
• Single rooms: R21 900
• Should 100% of meals be taken: R25 400

Tuks Village: Units for men
• Single rooms: R21 900
• Should 100% of meals be taken: R25 400

Private accommodation

Private accommodation is provided by the following institutions, among others:
• Arfon Properties: Tel: +27 (0)12 362 5499
  E-mail: arfon@icon.co.za
• City Property: Tel: +27 (0)12 362 4473
  E-mail: propworld@cityprop.co.za
• Off Campus Rental: Tel: +27 (0)12 362 6123
  E-mail: ocrental@telkomsa.net
• Sonop: Tel: +27 (0)12 460 7830
  E-mail: toniev@sonop.org.za
• South Point: Tel: +27 (0)12 341 1762
  E-mail: tumi@staysouthpoint.co.za

Open Day

Date: 21 May 2011
Time: 08:00 to 14:00

Who should attend?
• Grade 12 learners who have received confirmation that they are provisionally admitted to UP
• Grade 12 learners who meet the admission requirements and wish to hand in their application forms
• Grade 11 learners who are fairly certain that they will enrol
• The parents of the abovementioned learners

I am fascinated by engineering practices that allow miners to walk in safety, while breathing fresh air under 4 km of solid ground. Mining engineering is a challenging industry both physically and technically, but it is also a sophisticated and unique industry. I recently received the Sasol Geology Award for Mining Engineers and I am sponsored by Rossing Uranium Mine (Namibia). Geology gives me a detailed understanding of the properties and behaviour of rock or ground mass, which is critical to the safe and economic design of mines.

Tomas Aipanda
The Department of Library Services

The University’s Department of Library Services supports learning and creates a gateway to global information. Specialised services are provided through an online information service (referred to as the e-service) and faculty libraries. A global or federated search engine provides access to electronic journals, books and databases.

Merensky Library (Hatfield Campus)
Tel: +27 (0)12 420 2235 or +27 (0)12 420 2236 or +27 (0)12 420 3150
Fax: +27 (0)12 362 5100
Website: www.up.ac.za/library

Mamelodi Library
E-mail: jacob.mothutsi@up.ac.za
Tel: +27 (0)12 842 3566
Fax: +27 (0)12 842 3665

International Students Division
Tel: +27 (0)12 420 3111
E-mail: csc@up.ac.za
Website: www.up.ac.za/ISD
Location: Ground floor, Client Service Centre Office Block, University of Pretoria, Lynnwood Road, Hatfield.

The International Students Division is responsible for the pre-care, in-care and post-care of non-RSA citizens, who intend to enrol for studies at the University of Pretoria.

Higher Education South Africa (HESA)

The Matriculation Board forms part of Higher Education South Africa. The Board is responsible for administering the matriculation endorsement and exemption requirements. The online service will enable holders of the South African Senior Certificate from 1996 and holders of foreign school qualifications to assess whether their qualifications meet the admission requirements for university studies or if they require a certificate of exemption.

HESA
Tel: +27 (0)12 481 2847 or 481 2848
Fax: +27 (0)12 481 2922 or 481 2718
E-mail: exemption@hesa-enrol.ac.za
Website: www.hesa-enrol.ac.za/mb

Disclaimer:
This publication contains information about regulations, policies, tuition fees, curricula and programmes of the University applicable at the time of printing. Amendments to, or updating of, the information in this publication may be effected from time to time without prior notification. The accuracy, correctness, or validity of the information contained in this publication is therefore not guaranteed by the University at any given time and is always subject to verification. The user is kindly requested to, at all times, verify the correctness of the published information with the University. Failure to do so will not give rise to any claim or action of any nature against the University by any party whatsoever.

The EBIT Faculty is great and its degrees are accredited internationally. I know this makes the degree a valuable one. My experience is that the Mining Engineering Department goes out of its way to develop well-rounded graduates. The TukS Mining Society caters for the social side, while there is a strong soft-skills focus in some of the mining subjects.

In June 2010, I received a scholarship to present a paper at a conference in America. The topic was space mining and I spoke about mining layouts that could make mining ice on the moon more economical. My department supported me 100% by obtaining a sponsorship, for which I am so grateful.

Michael Neale

Faculty of Engineering, Built Environment and Information Technology
# Admission Point Score (APS) Conversion Table

<table>
<thead>
<tr>
<th>APS</th>
<th>NSC M-score</th>
<th>SC HG M-score</th>
<th>SC SG M-score</th>
<th>HIGCSE / NSSC HL</th>
<th>IGCSE / GCSE NSSC OL/ O-level</th>
<th>AS-level</th>
<th>A-level</th>
<th>IB HL</th>
<th>IB SL</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>A</td>
<td>7</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>B</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>B</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>7 (80–100%)</td>
<td>A</td>
<td>1</td>
<td>A</td>
<td>A</td>
<td>C</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>6 (70–79%)</td>
<td>B</td>
<td>2</td>
<td>B</td>
<td>B</td>
<td>D</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5 (60–69%)</td>
<td>C</td>
<td>3</td>
<td>C</td>
<td>A</td>
<td>C</td>
<td>E</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>4 (50–59%)</td>
<td>D</td>
<td>4</td>
<td>D</td>
<td>D</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3 (40–49%)</td>
<td>E</td>
<td>4</td>
<td>E</td>
<td>E</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2 (30–39%)</td>
<td>F</td>
<td>F</td>
<td>E</td>
<td>D/E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>1 (0–29%)</td>
<td>G</td>
<td>F</td>
<td>G</td>
<td>F/G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**NSC** - National Senior Certificate (completed Grade 12 in and after 2008)

**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

**IGCSE** - International General Certificate of Secondary Education

**NSSC** - Namibia Senior Secondary Certificate

**A-level** - Advanced Level

**O-level** - Ordinary Level

**AS-level** - Advanced Subsidiary Level

**IB** - International Baccalaureate Schools (higher levels and standard levels)