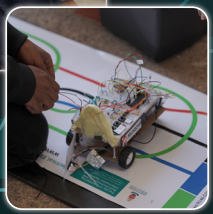
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

UNIVERSITY OF PRETORIA

GO » IMPACT



EBIT

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Engineering, Built Environment and Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en Inligtingtegnologie / Lefapha la Boetšenere, Tikologo ya Kago le Theknolotši ya Tshedimošo

Make today matter

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MESSAGE FROM THE DEAN

Finding innovative solutions that lead to real-world change is at the heart of the University of Pretoria's Faculty of Engineering, Built Environment and Information Technology (EBIT). We are home to a generation of leaders and innovators who are dedicated to making a difference.

Our students and researchers strive to contribute to society by focusing on topics that will solve global challenges. We therefore focus on becoming the change we want to see in the world through innovative and cutting-edge research, and collaborative community engagement.

From our students' first year of study until they graduate, they will be encouraged to do more than just qualify for a given profession. Our graduates are nurtured to become engineers who solve engineering challenges for future generations; built environment practitioners who create sustainable solutions for society; and information technology (IT) specialists who use the disruptive technologies of the Fourth Industrial Revolution to the utmost benefit of the human race.

Our academic community is increasingly concerned about the future of humanity, particularly in terms of global challenges such as energy security, food security, infrastructure security and data security. We seek solutions that extend beyond traditional disciplinary boundaries and contribute to society at large. The principles of Society 5.0 is a driving force in the Faculty. This phenomenon emphasises a human-centered approach, leveraging cyber-physical systems to create a society where people live comfortably and harmoniously with technology.

A degree from the University of Pretoria turns our students into professional engineers who can design things to support life beyond traditional engineering concepts, such as enhancing water security by improving the country's dams and sewerage works, and designing sensors to determine water quality.

Some of our graduates will become built environment practitioners who can design and plan locations to support life, such as clinics and schools that are easily accessible to people in rural areas, houses close to job opportunities, and infrastructure that provides efficient transportation. Others will become IT specialists who focus on data to support life, ensuring access to data, the security of data, and ICT solutions that support health, education and food security. Our strategic vision is to pursue innovation, while maintaining relevance for the present challenges.

GO IMPACT

Your university journey should be seen as a partnership, where EBIT equips you with the skills you need to impact and innovate. As a member of the EBIT Generation, you must go and find where you can make an impact and maximise your contribution to the greater good.

Prof Wynand JvdM Steyn
Dean: Faculty of Engineering, Built Environment and IT

THE FUTURE IS HERE...

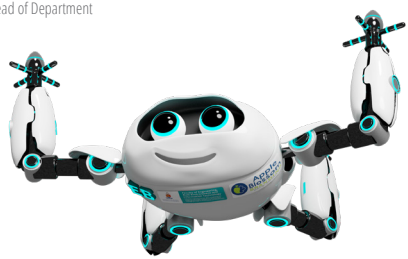
EBIT lecturers are encouraged to develop creative approaches to teaching. Their focus is on achieving improved academic performance and preparing students for the Future of Work.

In this way, the Faculty ensures that its graduates are not just exceptionally qualified professionals, but people who can make a meaningful contribution in the workplaces they enter by being equipped with empathy and people skills.

We have embraced the concept of immersive learning to provide students with a deep experience of reality. Through virtual reality (VR) tools, we immerse students in the learning experience to expose them to the work they will be doing when they enter industry in a fail-safe environment. In this way, we can take the classroom to a remote and unsafe environment such as an underground mine, or expose students to equipment and instruments in virtual reality before they work with them in the laboratory. Exposing our students to these emerging technologies allows them to make the mindshift towards a future in which their unique talents and experiences will further the development and growth of sustainable communities.

EBIT LEADERSHIP TEAM

*HoD: Head of Department



Deputy Dean: Teaching And Learning
Prof Alta van der Merwe

Deputy Dean: Research and Postgraduate Studies
Prof James Maina

HoD, Department of Civil Engineering
Prof H Gräbe

HoD, Department of Electrical, Electronic and Computer Engineering
Prof RM Naidoo

HoD, Department of Industrial and Systems Engineering
Prof O Adetunji

HoD, Department of Mining Engineering
Prof DF Malan

HoD, Department of Chemical Engineering
Prof MO Daramola

HoD, Department of Materials Science and Metallurgical Engineering
Prof N Naudé

HoD, Department of Mechanical and Aeronautical Engineering
Prof S Kok

Chair: Graduate School of Technology Management (GSTM)
HoD, Department of Engineering and Technology Management
Prof E van der Lingen

HoD, Department of Architecture
Prof C Combrinck

HoD, Department of Town and Regional Planning
Prof K Landman

HoD, Department of Construction Economics
Prof BG Zulch

HoD, Department of Computer Science
Prof H Venter

HoD, Department of Informatics
Prof H Smuts

HoD, Department of Information Science
Prof M Holmner

OUR FACILITIES

EBIT boasts over **90** laboratories across **three** of the University's campuses. This includes the state-of-the-art **Engineering 4.0 Complex**.

The University of Pretoria's Engineering 4.0 Complex houses several laboratories, and research and training facilities, dedicated to smart, sustainable transportation and infrastructure. The on-site work relates to concrete, timber, road construction, pavement testing, traffic data and railways. Through this initiative, EBIT is well on its way to earning itself the reputation as the country's leading expert in smart transportation. The research conducted in this facility is testimony to the Faculty's thought leadership and frontline position on the global stage.

WHY #ChooseUP

EBIT is a source of locally relevant and internationally competitive programmes, and home to some of the University's exceptional researchers.

We are one of the few academic faculties in Africa to feature among the top 650 in the world in **FIVE** subject areas in the 2024 QS World University Rankings by Subject in the field of engineering and technology.

- CHEMICAL ENGINEERING
- COMPUTER SCIENCE AND INFORMATION SYSTEMS
- ELECTRICAL AND ELECTRONIC ENGINEERING
- MECHANICAL AND AERONAUTICAL ENGINEERING
- MINERAL AND MINING ENGINEERING

72%

YOU'RE IN GOOD HANDS

72% OF EBIT ACADEMICS HOLD DOCTORAL DEGREES

WE HAVE WHAT YOU ARE LOOKING FOR

22
UNDERGRADUATE PROGRAMMES

37
HONOURS PROGRAMMES

57
MASTER'S PROGRAMMES

24
DOCTORAL PROGRAMMES

INNOVATION IS OUR BUSINESS

DISRUPTIVE TECHNOLOGY

VIRTUAL AND AUGMENTED REALITY

INTERNET OF THINGS

MACHINE LEARNING

ADDITIVE MANUFACTURING

DIGITISATION

SOCIETY 5.0

BIG DATA

SMART ALTERNATIVE TRANSPORT

ROBOTICS

GREEN BUILDING

ARTIFICIAL INTELLIGENCE

SMART GRIDS

AUTOMATION

SMART CITIES

FACULTY STRUCTURE

FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND IT

SCHOOL OF ENGINEERING

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

SCHOOL FOR THE BUILT ENVIRONMENT

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

SCHOOL OF INFORMATION TECHNOLOGY

- Department of Informatics
- Department of Computer Science
- Department of Information Science

GRADUATE SCHOOL OF TECHNOLOGY MANAGEMENT

- Department of Engineering and Technology Management

EBIT IS ORGANISED INTO FOUR SCHOOLS

The Faculty offers the unique combination of the fields of engineering, built environment and information technology. This places us in a position to conduct exceptional multidisciplinary research to address relevant challenges in society.




SCHOOL OF ENGINEERING

The School of Engineering presents programmes in all the major engineering disciplines, with many specialisations offered at postgraduate level. It is ranked **334TH** out of more than 10 000 engineering schools in the field of engineering and technology.

SCHOOL FOR THE BUILT ENVIRONMENT

The School for the Built Environment offers the entire spectrum of programmes in this field, and prioritises close ties and alignment with the building industry. The School places a particular emphasis on the equitable and sustainable development of people.

SCHOOL OF INFORMATION TECHNOLOGY

The School of Information Technology is a forerunner in the South African IT environment with its unique integration of the fields of computer science, informatics and information science. The School is also a proud member of the international iSchools Organization.

GRADUATE SCHOOL OF TECHNOLOGY MANAGEMENT

The GSTM is the largest school of its kind in Africa, and offers the only Master in Project Management programme in Africa to be accredited by the Global Accreditation Centre for Project Management Education Programs (GAC) of the Project Management Institute, USA.

DEPARTMENT OF CHEMICAL ENGINEERING

Bachelor of Engineering in Chemical Engineering
4-year programme

WATCH TO LEARN MORE ABOUT THE PROGRAMME

UP stands out as the premier choice for aspiring chemical engineers due to its unparalleled commitment to excellence, innovation and global impact. Our curriculum is uniquely designed to equip students with the skills and knowledge necessary to address pressing global challenges, particularly in Africa, where sustainable development is paramount. Through cutting-edge research and practical experience, graduates are prepared to tackle issues such as access to clean water, renewable energy solutions and environmental conservation.

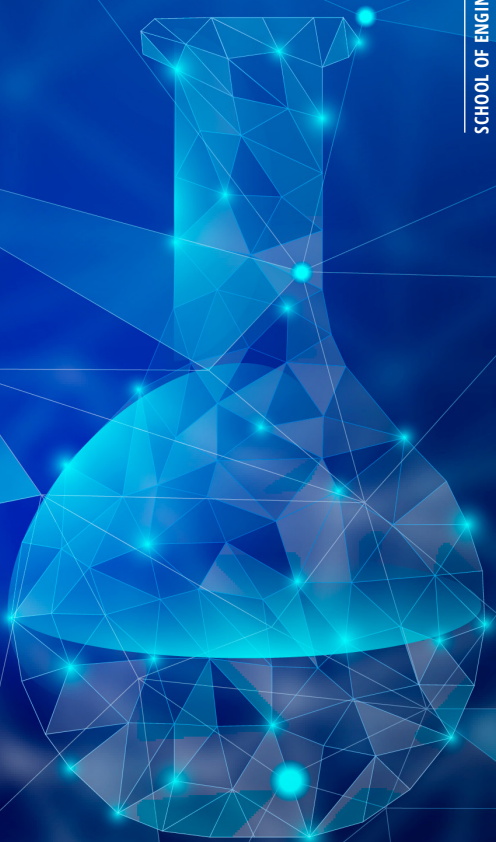
The bachelor programme is fully accredited by the Engineering Council of South Africa (ECSA), which attests to its sustained quality and international reputation. In addition, the 2024 QS World University Subject Rankings placed the Department in the top 400 globally.

The Department takes pride in its distinguished alumni, who have left indelible marks on various industries and sectors. These include notable figures like Honey Mamabolo, a former Managing Director of the South African Mint, and Dr Pulane Molokwane, who served as a Planning Commissioner in the Presidency of South Africa.

Our final-year students have a track record of developing groundbreaking solutions. A recent project focused on the development of a novel wastewater treatment system using cold plasma technology, showcasing UP's commitment to pushing the boundaries of conventional engineering.

Through strategic partnerships with leading universities and research institutions worldwide, UP fosters a diverse and dynamic learning environment that encourages global perspectives and cross-cultural understanding.

Choosing UP for a degree in chemical engineering offers unparalleled opportunities for personal growth, academic excellence and meaningful contributions to global challenges. With a strong emphasis on innovation, sustainability and international collaboration, you will be equipped with the skills and mindset needed to thrive in an increasingly interconnected world.



The School of Engineering is ranked 334TH out of more than 10 000 engineering schools in the field of engineering and technology.

DEPARTMENT OF CIVIL ENGINEERING

Bachelor of
Engineering in
Civil Engineering
4-year programme

WATCH TO LEARN MORE ABOUT THE PROGRAMME

The Department of Civil Engineering is a renowned hub of excellence in engineering education and research, both locally and internationally, with a distinguished history spanning 95 years. The Department has consistently evolved to meet the demands of the rapidly changing engineering landscape. At the heart of its success lies a robust curriculum that covers a breadth of subjects, from structural engineering and transportation to hydraulics, water resources and geotechnical engineering. This holistic approach ensures that graduates are adept at addressing real-world engineering challenges upon completion of their studies. The Department's crown jewel is the Engineering 4.0 facility, providing students with cutting-edge laboratory resources for hands-on learning experiences.

Under the mentorship of staff members, who are mostly professionally accredited and internationally recognised in their respective fields, students engage in pioneering research that encompasses infrastructure planning, design, construction and maintenance. A unique characteristic of the Department is that it integrates electronic technologies into civil engineering applications to innovate and advance the profession. Typical applications include structural health monitoring, smart infrastructure, geospatial technologies using drones and robotic platforms, as well as construction automation.

Forging strong industry ties, the Department collaborates closely with leading engineering companies and government agencies in Europe and the United Kingdom, the USA,

China, Australia and many African countries, enhancing students' learning through exposure to real-world projects and amplifying their employability upon graduation.

The Department's student body is composed of students from diverse cultural backgrounds. This inclusive environment fosters innovation and prepares graduates to excel in a globalised society. We distinguish ourself through our comprehensive curriculum, cutting-edge facilities, talented staff, industry partnerships and commitment to diversity. These elements synergise to produce graduates who are equipped to make significant contributions to civil engineering and society as a whole.

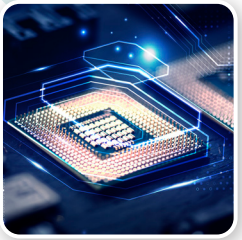
MOBILE SOILS LABORATORY

The Department of Civil Engineering has established a state-of-the-art mobile soils laboratory with the support of Anglo American. The laboratory is housed in an 8-ton truck, 9 m in length. It is fitted with two hydraulic stabilisers to provide lateral stability against wind when the laboratory is in use. It contains state-of-the-art equipment that can carry out sophisticated soil tests very close to where the samples are recovered. It offers new research opportunities in terms of the accurate determination of tailings properties. Not only will this provide the most accurate soil properties to assess the true state of the stability of tailings dams (which often measure kilometres in cross-section), it will also provide new insights into tailings behaviour as much of our understanding in terms of tailings behaviour in laboratory tests has been gained from samples at least partly disturbed during transportation.

CENTRIFUGE

The Department of Civil Engineering makes use of a unique Geotechnical Centrifuge Laboratory to research geotechnical, geological and mining-related problems. It does this by means of testing physical models. The centrifuge is also available for commercial testing. It is used to subject small-scale models of geotechnical problems to high accelerations. Because the stress-strain behaviour of soil is highly non-linear, high accelerations are necessary to impose full-scale stresses on models tested to ensure that the soil in the models strain realistically. It is capable of accelerating models weighing up to one ton to 150 times earth's gravity.

DEPARTMENT OF ELECTRICAL, ELECTRONIC AND COMPUTER ENGINEERING



CHOOSE ONE OF OUR THREE DEGREE PROGRAMMES

Bachelor of Engineering in Electrical Engineering
Bachelor of Engineering in Electronic Engineering
Bachelor of Engineering in Computer Engineering
4-year programmes

WATCH TO LEARN MORE ABOUT THE PROGRAMMES

Are you ready to be a pioneer in global technological innovation and to make a tangible impact on the world? Discover the unique opportunities that the Department of Electrical, Electronic, and Computer Engineering has to offer.

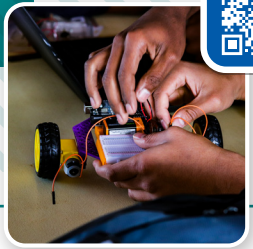
With courses that cover every aspect of modern technology, you will receive a practical education that prepares you for a dynamic career in engineering. Our department does not just teach engineering; we shape the future. Our cutting-edge education is focused on laying the foundations to ensure that our graduates are ready to tackle the tough, but important problems of our day.

Our lecturers are not only renowned researchers, but also industry leaders, providing invaluable insights and mentorship to our students. As a graduate, you will join the ranks of top engineers and entrepreneurs like electrical engineering graduate Corné van Biljon, co-founder and director of the Ocuron Technology Group.

Students in our department undertake innovative final-year projects, like creating a system for speech enhancement, which makes use of a moving speaker that utilises microphone arrays and beam-forming techniques.

Our programmes offer students the hands-on experience necessary to excel in industry by immersing them in real-world challenges. Under lecturers' expert guidance, students learn to apply their knowledge and skills to develop creative solutions under practical constraints.

By choosing to study at the University of Pretoria, you will gain the skills, knowledge and experience needed to thrive in today's rapidly evolving technological landscape. Whether you aspire to lead groundbreaking research, launch your own startup, or make a positive impact in your community, the Department of Electrical, Electronic and Computer Engineering will empower you to turn your ambitions into reality. Embrace the opportunity to shape the future – join us and become a part of something extraordinary.



ROBOT SCHOOL

The Department of Electrical, Electronic and Computer Engineering's Robot School forms part of its community engagement work with neighbouring schools. This enables second-year and final-year students in the Department, who need to complete a period of work-integrated learning, to teach learners to build robots. The Robot School comprises two mini courses of five lessons each, which are presented free of charge to learners from Grade 8 to Grade 11. It takes learners through all the basic steps of building a simple, self-navigating robot. The classes cover the 3D design and printing of the robot chassis, constructing the electronics of the robot, assembling it, programming it on an Arduino microcontroller development board to make the robot follow a track, and testing the robot. The project provides a platform through which students can serve the community by presenting fun activities related to science, technology, engineering and mathematics to learners.

DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING

Bachelor of Engineering in Industrial Engineering
4-year programme

WATCH TO LEARN MORE ABOUT THE PROGRAMME

UP's Department of Industrial and Systems Engineering is the premier industrial engineering department in South Africa and Africa. We graduated our first cohort in 1963. Consequently, we have produced the most industrial engineers in South Africa, both practitioners and academics. We have continued to maintain our rich tradition, and to evolve with time to remain relevant and at the cutting edge of industrial engineering globally.

Industrial engineering training involves training across a number of engineering disciplines. Coming to UP is an opportunity to be part of an elite engineering training institution in Africa. Studying industrial engineering at UP guarantees you one of the best training offerings you could have internationally, and our graduates are well sought after, not only in South Africa, but all over the world. Not only will you receive the all-round development in critical thinking that is expected of an industrial engineer. You will also have the opportunity to acquire cutting-edge industry skills and certifications, and learn with some of the most advanced training technologies, like the virtual and augmented reality solutions that are currently being deployed across a large spectrum of our Faculty's training programmes, including industrial engineering.

The age and size of our department means we have a large network of alumni, which you will join when you graduate. This can be one of the biggest prizes you will take with you as you complete your studies with us, as you access a large network of industrial engineering professionals built up over a long time.

Are these the types of questions you want to get the answers to?

- How do we get products to the customer **faster** and **cheaper**?
- How do we get passengers to their destination **safely** and **on time**?
- What data do we need for **effective** decision making, and how can we source it?
- How do we turn this data into actionable information that helps us make **tough decisions**?
- How should we manage inventory levels of products in a warehouse or store to **minimise cost**?
- What is the **best** factory layout and handling system for the movement of parts in a factory?
- How can we best route vehicles through a city to **minimise** travel time?

Study industrial engineering!

DEPARTMENT OF MATERIALS SCIENCE AND METALLURGICAL ENGINEERING

Bachelor of Engineering in Metallurgical Engineering
4-year programme

WATCH TO LEARN MORE ABOUT THE PROGRAMME

The discipline of metallurgy is one of humanity's oldest professions, with archaeological evidence tracing crude smelting back to the Copper Age (~3500 BC), and the publication of the seminal work, *De Re Metallica* by Georgius Agricola in 1556. Despite its ancient roots, this field, which now encompasses materials science, remains dynamic, and is continuously advancing to address contemporary challenges such as resource sustainability, the circular economy and global environmental concerns.

The Minerals Engineering Trust Fund (METF) distinguishes the Department of Materials Science and Metallurgical Engineering at the University of Pretoria as the premier metallurgical engineering department in South Africa. It boasts a cadre of highly qualified and experienced lecturers and support staff. Our team is committed to enriching the educational experiences of our students.

Established in 1958, the Department has undergone continual evolution over its 66-year history to meet the evolving demands of the metallurgical domain. Our curriculum, which is recognised as one of the most comprehensive globally, spans the breadth of metallurgy, and encompasses minerals processing, hydrometallurgy, pyrometallurgy, physical metallurgy and welding. This holistic approach equips our graduates to tackle real-world engineering challenges adeptly.

Housed in the recently refurbished Minerals Science Building, alongside the departments of Geology and Mining Engineering, our department enjoys state-of-the-art laboratories and resources, fostering an environment that is conducive to cutting-edge research and learning.

Our strong industrial partnerships ensure that our research and teaching remain relevant and responsive to emerging technologies, such as green processing methods and the circular economy.

We are privileged to receive sponsorships from industry partners, which facilitate pioneering research endeavours.

The Department of Materials Science and Metallurgical Engineering at the University of Pretoria is dedicated to excellence in education, research and industry collaboration, driving innovation and progress in the field of metallurgy and materials science.

ADDITIVE MANUFACTURING

A new development in materials science is digital manufacturing. This is a method of using digital technology in the manufacturing process. Additive manufacturing is the industrial production name for 3D printing. It is a computer-controlled process that creates three-dimensional objects by depositing materials layer by layer. It uses computer-aided design and allows for the creation of objects with precise and complex geometric shapes. Additive manufacturing is the opposite of traditional manufacturing, which often requires machining or other techniques to remove surplus material (subtractive manufacturing). The materials that are used for additive manufacturing are mostly based on materials that have been developed for traditional subtractive manufacturing methods. These materials are not necessarily the best choices for additive manufacturing, and it is up to materials scientists and metallurgical engineers to develop new materials that are better suited to the demands of digital manufacturing. Such new materials can create exciting new opportunities to develop products with properties that could otherwise not be achieved.

DEPARTMENT OF MECHANICAL AND AERONAUTICAL ENGINEERING

Bachelor of Engineering
in Mechanical
Engineering
4-year programme

WATCH TO LEARN MORE ABOUT THE PROGRAMME

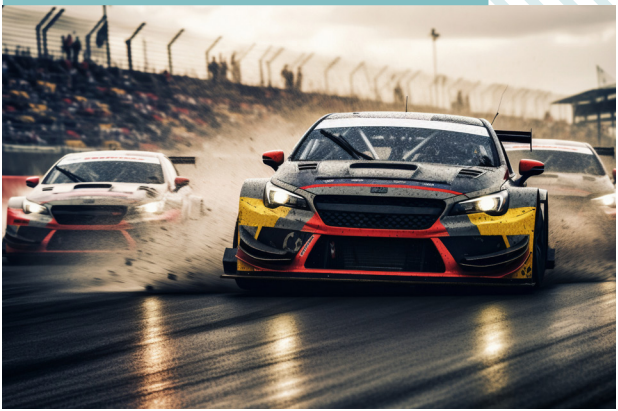
UP's Department of Mechanical and Aeronautical Engineering is ranked No. 1 in South Africa and is ranked in the top 300 (according to the 2024 QS rankings) and the top 200 (according to the 2023 Shanghai rankings) for mechanical engineering globally.

We have a strong emphasis on excellence in teaching and research. Our committed and knowledgeable team is well equipped to support learning and the development of technical skills, from undergraduate to postgraduate levels. We offer a unique learning environment with opportunities for the practical application of theoretical knowledge in activities like the Tuks Baja team and the AREND flight project.

An exchange programme with the Massachusetts Institute of Technology (MIT) in the USA makes it possible for students to study at MIT for a year, and for MIT students to study at the University of Pretoria for a year.

Our internationally esteemed research groups in the fields of physical asset integrity management, vehicle dynamics and clean energy are generating excellent, state-of-the-art research that has significantly impacted on a number of fields, including concentrated solar power systems, novel and enhanced heat transfer phenomena, off-road tyre parameterisation, vehicle collision management systems, vibration monitoring and turbine conditioning monitoring.

The Department boasts world-class facilities that include many well-equipped experimental laboratories that are designed to assist teaching, learning and research in dynamics, structural mechanics, thermodynamics and fluid mechanics, as well as software laboratories for simulation and data-driven education and research.



MECHATRONICS: WHERE MECHANICS MEETS ELECTRONICS

Mechatronics is a combination of the principles of mechanics, electronics and computing. Mechanical engineers are primarily interested in the mechanical nature of objects and therefore focus on the design, manufacture and maintenance of physical systems. Mechatronics uses sensors to sense what is happening in a mechanical system, and a processor to take the sensor information and decide which actuators to actuate to ensure that the system does what needs to be done. Whether this process is used to control robots to manufacture more robots or to develop autonomous robots that can move from one point to another through obstacles without human intervention, a combination of mechanical and electronics expertise is used. Almost all mechanical systems currently in use are equipped with sensors, actuators and processors to make them safer and more efficient for human use. You can study to become a mechatronics engineer at the University of Pretoria by enrolling for either a degree in Mechanical Engineering or a degree in Electrical, Electronic and Computer Engineering.

DEPARTMENT OF MINING ENGINEERING

Bachelor of Engineering in Mining Engineering
4-year programme

WATCH TO LEARN MORE ABOUT THE PROGRAMME

The mining industry is a major force in the world economy, occupying a key position at the beginning of the resource supply chain. Mining engineers from the University of Pretoria are proudly at the forefront of tackling global challenges, growing the economy in South Africa and ensuring a supply of critical minerals to all sectors in the economy.

"If you cannot grow it, you have to mine it" is a famous statement that reflects the importance of minerals and metals in the world. From the construction of every building to every device we use, everything around us contains metal compounds.

As an example, Willie Theron, a graduate from the Department, is currently Operations Executive at Northam Platinum Mining. He was instrumental in the development of the Booysendal Project, which began in 2009. This has resulted in the development of people and communities, as well as impressive engineering innovations, including a system that transports platinum ore from Booysendal South to the existing processing plant over a distance of 4.8 km through hilly terrain.

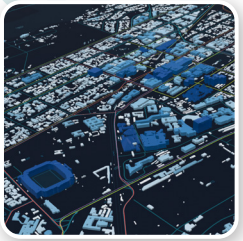
As a student, you will be involved in other interesting projects. Some of our students work on projects using extended reality (XR) and virtual reality (VR) to train mine operators to identify hazards. Some of these students also use state-of-the-art technology, such as numerical modelling programs, to design more productive and safer mines.

Studying at the University of Pretoria will also give you access to our international partners. We collaborate with the University of New South Wales in Sydney, Australia, on methods to design improved mining layouts. As a qualified mining engineer, you will be sought after to work in countries such as Canada and Australia, where there are a shortage of mining engineers.

IMMERSIVE LEARNING

The Faculty has embraced the concept of immersive learning as an innovative teaching approach to provide learners with a deep experience of reality. Through virtual reality (VR) tools, it is not just possible to take the classroom to a remote and unsafe environment, such as an underground mine, but students can potentially be taught to operate equipment in the virtual space before they are exposed to the actual machinery in the laboratory. This not only reduced the chance of accidents, but increases accessibility. The Department of Mining Engineering is a trailblazer in this initiative, having established a VR training centre in 2015. This facility comprises floor-to-ceiling screens on which 360° 3D images are displayed with cinematic clarity and highly realistic sound effects.

DEPARTMENT OF ARCHITECTURE



Bachelor of Science
Architecture
3-year programme

WATCH TO LEARN MORE ABOUT THE PROGRAMME

The following aspects of the University of Pretoria's undergraduate architecture programme sets it apart from other programmes offered in the country:

- The emphasis on community engagement, wellbeing and environmental responsibility in the curriculum instils an ecosystemic ethos based on principles of regenerative design, which prepares our students for their responsibilities as professionals, who are able to respond to the challenges of the 21st century.
- The vertical integration of the different curriculum streams provides a coherent narrative of engaging with the knowledge that builds from first-year to third-year and beyond into the Department's postgraduate programmes.
- The horizontal integration of the theory explored in the various modules in each year, with design outcomes in each year, ensures that students understand how the theory is applied in practice.
- Students are exposed to a multi-disciplinary learning environment where the disciplines of interior architecture, architecture, urban design and landscape architecture are treated as one integrated spatial design continuum.
- The University of Pretoria was ranked 42th globally in the 2024 Times Higher Education Impact Rankings, which measures work towards the United Nations' Sustainable Development Goals.

TEAMWORK MAKES THE DREAM WORK

The global construction industry contributes significantly to the emission of greenhouse gases and depletion of resources. This is aggravated by the waste generated in the construction and demolition of buildings. Members of the Faculty's departments of Architecture and Civil Engineering therefore embarked on an innovative approach in which they adopted a circular value chain for building materials. It entailed reusing, refurbishing and recycling existing material and products, which would otherwise have ended up in the country's landfill sites. The result was a transdisciplinary training model that employed computer models with building information data. Its success depended on collaboration and teamwork between members of the individual disciplines. It achieved international recognition for its impact, scalability and sustainability by receiving the Quanser Global Sustainability Award for 2023. It was the only shortlisted project from Africa.

DEPARTMENT OF CONSTRUCTION ECONOMICS

CHOOSE ONE OF OUR THREE DEGREE PROGRAMMES

Bachelor of Science *Construction Management*
Bachelor of Science *Quantity Surveying*
Bachelor of Science *Real Estate*
3-year programmes

WATCH TO LEARN MORE ABOUT THE PROGRAMMES

As the construction industry is a significant contributor to global CO_2 emissions, graduates can contribute to the global challenge by joining the international drive to reduce CO_2 emissions in the industry.

This can be done, for example, through net positive or green buildings that reduce CO_2 in the atmosphere rather than adding to it. Graduates in Construction Economics can contribute by developing (real estate) and constructing (construction management) net positive buildings, and conducting lifecycle assessments on embodied carbon (quantity surveying).

The Department is accredited by international industry bodies for all its degree programmes, including the Royal Institution of Chartered Surveyors (RICS) and the Chartered Institute of Building (CIOB). It also collaborates with BA ISAGO University (Botswana), Federal Polytechnik University (Nigeria), Kufstein FH Tirol (Austria), the Association of South African Quantity Surveyors, the Green Building Council of South Africa, Atterbury Properties, York Timbers, the Pacific Association of Quantity Surveyors, RLB (cost benchmarking; Crane Index), CIB (Task Group 124: Net Zero Carbon: Building Design & Construction).

DEPARTMENT OF TOWN AND REGIONAL PLANNING

Bachelor of Town and Regional Planning
4-year programme

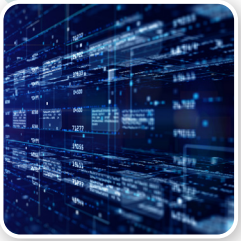
WATCH TO LEARN MORE ABOUT THE PROGRAMME

Cities across the world are changing rapidly. Urban systems and spaces are changing to accommodate moving people and new functions. This is driven by things like population growth, migration, climate change, economic decline in rural areas and political instabilities. Graduates from the Department of Town and Regional Planning (TRP) can contribute to mitigating and addressing challenges globally and in Africa. They do this through a detailed and well-rounded understanding of the causes and possible solutions to deal with rapid change. This will contribute to more resilient cities, and harvest the potential inherent in cities to create healing and thriving environments.

Our research positions the Department to make an impact in practice. In 2023, the final-year students worked on projects related to resilience, green infrastructure, regenerative public space, mining and municipal capacity building, planning interventions for township businesses, informality and transdisciplinarity in planning research. Some of our key research projects include work on municipal governance and capacity building, spatial transformation, housing development trends and regenerative public space.

Members of the Department are currently working with the University of Amsterdam (The Netherlands), the Technical University of Berlin (Germany), the Sydney University of Technology (Australia), the University of Cardiff (United Kingdom), the University of Alto (Helsinki, Finland) and the University of New Delhi (India).

DEPARTMENT OF INFORMATICS



CHOOSE ONE OF OUR TWO DEGREE PROGRAMMES

- Bachelor of Commerce *Informatics*
- Bachelor of Information Technology in Information Systems

WATCH TO LEARN MORE ABOUT THE PROGRAMMES

3-year programmes

Studying informatics or information systems at the University of Pretoria is a smart choice if you are interested in technology and its impact on the world. In today's digital age, where technology is crucial for businesses in every industry, this field offers diverse career opportunities.

In the Department of Informatics, you will gain practical skills in areas like system analysis and design, software development, databases, critical thinking and data analytics. With hands-on learning experiences such as our capstone project, you will be able to apply what you learnt to real-world situations. For the capstone project, you will engage with a real-world industry client, document their software solution requirements, design their system by writing the software code, and test the system to ensure that the solution is working according to the industry client's requirements.

Our degrees' international accreditation with the Accreditation Board for Engineering and Technology (ABET) means that you are well prepared for the job market. In addition, the Department's supportive learning environment and dedicated lecturers will ensure that you receive the help you need to succeed.

Informatics is an exciting field with endless possibilities for innovation and growth. If you are therefore passionate about technology and eager to make a difference, studying Informatics at the University of Pretoria is the perfect fit for you!

DEPARTMENT OF COMPUTER SCIENCE

CHOOSE ONE OF OUR TWO DEGREE PROGRAMMES

- Bachelor of Science *Computer Science*
- Bachelor of Science *Information and Knowledge Systems*

WATCH TO LEARN MORE ABOUT THE PROGRAMMES

3-year programmes

The Department of Computer Science fulfils a vital role within the broader information technology (IT) spectrum in South Africa, as well as internationally. Its main objective is to explore and research the scientific basis of new technologies. It furthermore promotes the proliferation of reliable, robust and innovative computing and information technologies into South Africa's IT industry.

Excellence in computer science education, the development of internationally and nationally recognised research initiatives, and strong industry collaboration are the driving factors that underpin the Department's success. Its researchers work in the areas of artificial intelligence, computer and information security, digital forensics, computer science education didactics and applications, system specifications and formal methods, software engineering and software architecture, and data science. In addition to its bachelor's degree in computer science, the Department also offers a cutting-edge undergraduate programme in information and knowledge systems.

The Department has established itself as a very strong research entity, both nationally and internationally. It is ranked among the top 1% of computer science departments in the world based on citations of its research outputs, according to the Essential Science Indicators. It is also ranked in the top 650 in the world for computer science and information systems according to the QS World University Subject Rankings.

DEPARTMENT OF INFORMATION SCIENCE

CHOOSE ONE OF OUR THREE DEGREE PROGRAMMES

Bachelor of Information Science
Bachelor of Information Science *Multimedia*
Bachelor of Information Science *Publishing*
3-year programmes

WATCH TO LEARN MORE ABOUT THE PROGRAMMES

Choosing the University of Pretoria for a degree in Information Science offers a unique blend of academic excellence, research opportunities and a strong alumni network. As a graduate from the Department of Information Science, you will be equipped to tackle global challenges in both Africa and worldwide.

The Department of Information Science is concerned with how information is generated, organised, circulated and utilised in society. It houses programmes in three unique information-related fields: information science, multimedia and publishing.

By leveraging the knowledge gained at UP, you can contribute significantly to addressing information access disparities, digital literacy issues and data management challenges that are prevalent in Africa and globally.

The Information Science programme focuses on the use of information technology and the processing of information products. It is designed to train students in the management, retrieval, organisation, packaging and distribution of information, thereby adding value to it.

The Multimedia programme is an IT-focused degree that is situated at the intersection of computer science, graphic design and web development. It trains students to work in a team of developers and designers by furthering their understanding of design, animation and game design.

The Publishing programme teaches publishing theory and skills that enable students to select and develop content based on the needs of the user, and to appropriately package this content through a process of adding value. It offers students access to the full publishing value chain.

Prospective students can draw inspiration from Akani Simbine, a distinguished alumnus whose success exemplifies the Department's ability to nurture talent.

UP's affiliation with the iSchool organisation signifies its dedication to advancing research and innovation in information science, providing students with a platform to engage in groundbreaking projects with real-world implications. This partnership opens opportunities for collaboration on projects that have a meaningful impact on information dissemination and management on a global scale.

By choosing UP for your Information Science studies, you will not only equip yourself with the necessary skills for success in the information age, but also position yourself to make meaningful contributions to global challenges, fostering a brighter future for Africa and the world.

VIRTUAL IS THE NEW REALITY

SCHOOL OF INFORMATION TECHNOLOGY LABORATORIES

IMMERSIVE TECHNOLOGY LABORATORY

The Department of Information Science's Immersive Technology Laboratory is the first of its kind on the Hatfield Campus. It is a space where students and staff can be exposed to the latest immersive technology tools, such as virtual reality (VR) and augmented reality (AR). This includes simply playing around with the technology and gaining confidence in using it. Students in the undergraduate and honours Multimedia degree programme use the laboratory to develop VR experiences for their research projects. However, all students can access the laboratory by making a booking on the online platform. They can use it to play VR games or use the space for development. It aims to improve staff and students' awareness of this technology, and ultimately integrate it into more teaching activities as part of the Faculty's immersive learning approach. It can also be used to perform cutting-edge research in various application areas.

INFORMATICS DESIGN LABORATORIES

The Faculty's Informatics Design Laboratories consist of a Mobile Development Laboratory and a User Experience (UX) Laboratory. The laboratories provide students with a creative space to learn about and experience current trends in technology design. A range of mobile development and human-computer interaction (HCI)-related services are provided, specialising in the use of eye tracking technology in usability and UX design and evaluation. The team offers a unique combination of practical and theoretical knowledge.

Its expertise ranges across various fields, including web development, interaction design, systems design and development, cognitive psychology and e-learning. This skill set equips the Department of Informatics to execute its design and evaluation projects effectively and judiciously, and to offer training programmes to a wide audience.

COMMUNITY-BASED PROJECT MODULE

The ability of EBIT's students to operate in a complex and multicultural environment is strengthened by the Faculty's focus on community engagement.

In the JCP module, all EBIT students engage with a section of society that is different from their own social background. The goal is for students to develop an awareness of personal, social and cultural values, as well as multidisciplinary and life skills, like communication, interpersonal and leadership skills.

23 000+

STUDENTS HAVE COMPLETED THE JCP MODULE SINCE ITS INCEPTION IN 2005

STUDENT LIFE

We encourage our students to actively participate in university student life. This supports the development of well-rounded future leaders. The University hosts a wide range of student life activities through campus organisations like the Student Representative Council (SRC), Student Culture (STUKU), the Student Sport Committee (SSC) and RAG. All our students automatically become part of **EBIT House**, which represents students and acts as a communication channel between the Faculty and its students. **Follow EBIT House on social media.**

STUDENT SUPPORT AT EBIT

FOUNDATION PROGRAMMES

EBIT facilitates inclusiveness through the University's Foundation Programmes. These programmes focus on providing educational pathways into science, technology, engineering and mathematics (STEM) fields. Qualifying students complete their first year through the Foundation Programmes on Mamelodi Campus before entering a mainstream programme.

ENGINEERING FIVE_YEAR PROGRAMME

The five-year programme provides a carefully structured curriculum to help students adjust to university life and cope with its academic demands. It is offered in all engineering disciplines. It is a five-year programme, in which the volume of work is gradually increased, while the support provided is decreased over a period of three years. However, the workload is high from the beginning.

Students take the same first-year modules as students following the four-year degree programme, and attend the same classes, but the modules are spread out over two years. In their third year of study, students take the remaining second-year modules, while they follow the same programme as the four-year degree programme in their last two years of study.

STUDENT SUCCESS COACHES

The EBIT student success coaches support students by providing ongoing assistance with study and examination skills, time management and other co-curricular issues. Academic support is rendered through an open-door policy. The coaches seek to empower students by teaching them life skills through holistic development interventions so that they can become well-rounded individuals, employers or employees, and responsible citizens. They also have professional qualifications in counselling, which means that they can identify issues and refer students to the correct support structures.

A HOME FOR ENTREPRENEURS

TuksNovation is a non-profit company for technology incubation and acceleration that is located at the University of Pretoria. It acts as a catalyst for the development of business technology clusters to positively impact on the South African economy.

INNOVATION COMMERCIALISATION

In a knowledge-driven economy, universities play a major role in regional socio-economic development. Innovations arising from a university's intellectual capital can stimulate economies through new product development. Universities are thus highly valued in terms of economic potential. The creation of spin-offs is one of the key mechanisms that universities can leverage to promote socio-economic development.

SUPPORT FOR STUDENTS

TuksNovation provides technology development and entrepreneurship support, from the prototype to the commercialisation growth stages, to ensure that the technology is fully developed, and addresses a relevant market need. A virtual incubation programme focuses on technology and techno-entrepreneurship skills, while an acceleration programme focuses on commercialisation and business growth.

Scan to learn more about us

Scan to read the full undergraduate faculty brochure

Have a degree in mind? Scan to apply now!

Become a part of the #EBITGeneration – make a lasting impact.

www.up.ac.za/ebit

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