Bachelor of Engineering (Materials)

Open Day will be held on Sunday 15 August 2010, City West campus. Visit unisa.edu.au/openday
Information Sessions will be held at the **Careers Festival,** Sunday 29 August 2010, Mawson Lakes campus. To register, visit unisa.edu.au/infosessions
Drop-In Times will be available from 6-10 December 2010, from 9.00am – 7.00pm at Campus Central, Mawson Lakes campus. An additional **Information Session** will be held on Wednesday 15 December, 2010, at 6.30pm, Mawson Lakes campus. To register visit unisa.edu.au/infosessions

SATAC code	434841
UniSA program code	LBMR
CRICOS code (international students only)	065053E
TER (February 2010 cut-off)	N/A
Program length	4 years
Prerequisites	SACE Stage 2 Mathematical Studies and Chemistry
Assumed knowledge	SACE Stage 2 Physics
Home campus	Mawson Lakes
Accepts Special Entry (STAT)	Yes
External study available	No
Part-time study available	Yes
TAFE credit available	Yes
Honours study available	Yes
Program fees	Commonwealth supported
Program fees (international students only)	(A$) $23,500 per annum
Scholarships available	unisa.edu.au/scholarship

Program overview

When designing or improving a product, one of the first things to consider is the material itself. Materials engineers select materials, fabricate new devices and make existing ones work better through improving the material properties, reducing processing costs and increasing strength and resilience. Materials engineering includes aspects of applied physics, chemistry, and chemical, mechanical, civil and materials engineering, as well as new high-tech areas such as nanotechnology.

In addition to metallurgy and materials engineering related to the minerals and mining industries, there are a range of industries requiring engineers with exposure to a range of materials and materials engineering concepts – from materials processing (including metals and minerals) through various manufacturing, biomedical and processing industries. Advanced materials such as ceramics, composites and biomaterials are also becoming increasingly used.

Accelerated three-year Engineering program

It is possible to complete this program in less than four years by undertaking courses offered during study period breaks. This accelerated option will be offered by the Program Director to students who achieve outstanding grades in the first year.

What will I study?

In the first year, all Engineering students study eight core engineering courses, including Engineering Design and Innovation, Mathematical Methods for Engineers 1 and 2, Mechanics and Physics, Computer Techniques, Sustainable Engineering Practice and Electrical and Energy Systems. These courses provide a practice-centred foundation to engineering that exposes students to the breadth of cross-disciplinary studies as well as how engineering is applied in industry. Students undertake a number of hands-on engineering projects including participation in the Engineers Without Borders Challenge. By the end of first year, students can choose an area of interest to specialise in.

Courses in the second and third years are arranged to give the program a practice based emphasis and allow students to study areas such as materials characterisation, materials chemistry, polymer science, design in plastics and advanced composites, and thermal processing and metallurgy. Students will study advanced topics in materials science and engineering in final year, together with specialised areas relating to the use of materials in practical applications.

Final year may be taken as an honours year for students with outstanding academic results. The program has a strong practical and industry focus and students may choose to undertake their final year project with one of UniSA's leading research centres or work on a real-life industry project with one of UniSA's industry partners.

TAFE Certificate IV, Diploma or Advanced Diploma holders will be granted some credit towards this program.

Students who graduate from this degree are able to apply for entry into the Master of Engineering (LMEN), and receive credit for four courses completed in the undergraduate degree. Hence it is possible to gain a bachelor and master degree in five years of full-time study.

What does it take?

Strong interpersonal skills are required, matched with the ability to identify, analyse, design and solve problems. Students should be competent in mathematics, physics and chemistry. Good verbal and written communication skills and an inquiring mind are also important.

Who will employ me?

Materials Engineering graduates will find work locally and internationally in the minerals, mining, manufacturing, aerospace, automotive and processing industries. Many high technology products make extensive use of advanced materials, and materials engineering plays an important role in ensuring products are environmentally sustainable as well as economically competitive.

Professional recognition

This program meets the requirements for accreditation by Engineers Australia and is recognised internationally.

Graduates meet the academic requirements for attaining Chartered Professional Engineer status. Accreditation of any new Engineering program occurs in the first year it is offered. Such accreditation is provisional until the program produces its first graduates.

Honours

Students achieving a credit level average at the end of the third year will be invited to enrol in the honours project in the fourth year. Successful completion of the program and the honours project may lead to the award of a degree with honours.

Program requirements

FIRST YEAR

- Computer Techniques
- Engineering Materials
- Mathematical Methods for Engineers 1
- Sustainable Engineering Practice
- Electrical and Energy Systems
- Engineering Design and Innovation
- Mathematical Methods for Engineers 2
- Mechanics and Physics

SECOND YEAR

- Mechanics and Structures
- Engineering Modelling
- Materials Chemistry
- Mechanical Engineering Practice N
- Materials Characterisation
- Mechanical Design Practice
- Fluid and Energy Engineering
- Elective
- Industrial Experience

THIRD YEAR

- Polymer Science
- Energy Conversion and Management
- Project Planning and Control
- Manufacturing Practice
- Design in Plastics and Advanced Composites
- Surface Engineering
- Thermal Processing and Metallurgy
- Ceramics and Composites

FOURTH YEAR

- Materials Engineering Project 1
- Materials in Service
- Specialisation Elective 1
- Materials Engineering Project 2
- Materials Selection

SPECIALISATION ELECTIVE 2

FOURTH YEAR (HONOURS)

- Materials Engineering Project 1
- Materials in Service
- Specialisation Elective 1
- Materials Engineering Honours Project 2
- Materials Selection
- Specialisation Elective 2

Renee Goreham

Phd student
Mawson Institute

'I enjoy many aspects of the engineering profession. For one I would like to think that what I do may influence the way we all live. Essentially I feel that I make a difference. I got into engineering by accident (to tell the truth). I started my degree in forensics and analytical techniques and when it was time to undertake my postgraduate studies I realised that I was interested in engineering new materials and making old materials better. The thought of generating new compounds/materials that can change the way we live, such as polymers, Kevlar or POSS (Polyhedral Oligomeric Silsesquioxane) drives my research.

If I could change or inspire one thing for the engineering profession I would like to improve the quality of information provided to high school students about engineering and promote the benefits of studying science and mathematics. I would also love to promote the use of chemistry in engineering, which can often be overlooked.

As a rural student I found that I was not provided with a lot of career information whilst in high school. It was also very difficult to talk to someone face to face about careers in engineering and science or to undertake work experience in this field. I would love to have the opportunity to take engineering information to rural schools.

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