



UniSA

Science and Mathematics

- Mathematical Sciences
- Quantitative Finance
- Science
- Double Degrees
- Honours Degrees

2012

Why study Science and Maths at UniSA?

- » A flexible Science program with eight majors to choose from in the areas of the physical, environmental and life sciences
- » A number of scholarship options and selected students have the unique opportunity to work with business or industry on a major Mathematics Clinic Project
- » 87.2 per cent of Mathematics graduates are employed within four months of completing their degrees *

* GradStats, Graduate Careers Australia, December 2009

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The recent Excellence in Research Australia (ERA) awards recognised UniSA's **Division of Information Technology, Engineering and the Environment** with world-class rankings for leading research in the areas of Mathematical Sciences, Pure Mathematics, Applied Mathematics, Chemical Sciences, Physical Chemistry (Including Structural), Environmental Sciences, Environmental Science and Management, Engineering, Chemical Engineering, Civil Engineering, Electrical and Electronic Engineering, Materials Engineering, Resources Engineering and Extractive Metallurgy and Urban and Regional Planning.

Welcome



The University of South Australia is a university of first choice for career-focused achievers. We provide the widest range of degree programs in South Australia and have a reputation for excellence in our four faculty divisions. At the University of South Australia, some of the world's

brightest minds teach and research in the areas of business, education, arts and social sciences, health sciences and information technology, engineering and the environment.

In the 2010 QS World University rankings, the University of South Australia recorded the biggest increase for an Australian university and we are now in the top 3 per cent of more than 10,000 universities in the world.

The quality of our teaching is regularly recognised by awards such as Citations for Outstanding Contributions to Student Learning, and two of our academics have won the nation's highest honour for university teachers, the Prime Minister's Award for University Teacher of the Year.

It's that quality teaching that helps our graduates in their careers; in 2010 almost 80 per cent of the University's domestic bachelor graduates secured full-time employment, which is above the national average.

Besides providing a high-quality teaching environment, the University of South Australia is a research leader. Our research institutes address research questions in a range of priority areas, including community sustainability, population health, defence and security, minerals science and business.

We have recently had proof that we are on the right track. The first Excellence in Research for Australia assessment – an official national evaluation of the quality of research – showed that 70 per cent of our assessed research is of world-class standard and in several areas we have built research that is performing well above world-class levels. The University's research informs our teaching and learning activities.

As a student at the University of South Australia you will have a world of opportunities open to you: you will be able to develop a capacity for critical and independent thinking; learn the value of research; develop the most up-to-the-minute knowledge of your chosen profession and learn the essential skills in communication and teamwork that will help you forge a successful career.

I wish you luck in all your academic endeavours.

Professor Peter Høj

Vice Chancellor and President

Science and Mathematics

Mathematics and statistics is an important part of our everyday life and graduates of this discipline are highly sought after. UniSA's Bachelor of Mathematical Sciences or Bachelor of Quantitative Finance allows students to develop problem-solving skills, an ability that is highly valued by prospective employers. Graduates have a broad selection of professions to choose from, especially since mathematics is used in, and underpins, all areas of science, finance, engineering, agriculture and health science. Fields in which mathematics graduates are in great demand include government, teaching, logistics, business, finance and computing.

For more information please visit: unisa.edu.au/math

Science forms the foundation of our dynamic world and has a particularly close affiliation with industry and technology. The Bachelor of Science is one of UniSA's most flexible programs, with all streams providing students with fundamental experience in practical fieldwork and active, project-based learning activities. Studies within the disciplines of applied physics, biology, chemistry, computer science, environmental systems, geoscience, geospatial information systems or mathematics and statistics (majors) and psychology (minor) lead to a range of inspiring and well paid career paths.

The Bachelor of Science (Advanced Materials) is a new multi-disciplinary science program which focuses on the priority areas for South Australia, namely the Mining, Water, Energy and Health sectors. Graduates will be highly sought after as SA's priority areas boom in the coming years.

For more information please visit: unisa.edu.au/science

Why Study Mathematics or Science at UniSA?

The School of Mathematics and Statistics is located on the Mawson Lakes and City West campuses. The School offers undergraduate and postgraduate degree programs, as well as over 75 courses throughout the University.

The School is actively engaged in research, research training and consultancy through its Centre for Industrial and Applied Mathematics and Phenomics and Bioinformatics Research Centre.

Student Projects with Industry

For selected Mathematical Science students there is the unique opportunity to work with business or industry on a major Mathematics Clinic Project. This project is the only one of its type in Australia and more than 250 organisations have participated worldwide, resulting in over 1000 completed projects in the areas of engineering, computer science, mathematics, physics and multidisciplinary areas.

Scholarships and Awards

Our scholarships offer financial assistance and, in many instances, valuable work experience opportunities which often lead to employment. New scholarships are constantly being developed so we recommend you regularly visit unisa.edu.au/scholarship

Hypatia Scholarship

If you are a mathematically talented female year 12 student interested in a degree that offers a wide range of career options with excellent employment and salary opportunities, then the Hypatia Scholarship and our Mathematical Sciences or Quantitative Finance degrees will kick-start your future. These prestigious scholarships provide:

- » \$5000 cash to support your studies
- » A dedicated personal study area within the University for the duration of your program
- » Your own personal computer or laptop
- » Summer internship with the Scholarship sponsors, and
- » The support of the Hypatia network of like-minded, talented female mathematics students.

For further information visit unisa.edu.au/maths/scholarships

A Flexible Pathway to a Career in Surveying

The Bachelor of Science provides a pathway to the Master of Surveying. The Master of Surveying is designed to develop students who possess the theoretical background, professional ethics and practical skills necessary to undertake professional land surveying measurements and analysis.

Graduates of this program will be eligible for membership of the Spatial Sciences Institute (SSI), with the vast majority gaining full time employment within three months of graduating. For further information on surveying and pathways visit: unisa.edu.au/surveying

International Experience Global Experience

UniSA's Global Experience program is available to all undergraduate students enrolled at UniSA and counts towards your degree. Expand your knowledge through networks, workshops and a range of activities including volunteering, language studies, mentoring and going on exchange. For more information please visit: unisa.edu.au/globalexperience

Student Exchange

Going on exchange contributes to students' personal and academic development and is considered favourably by many employers. UniSA provides scholarships of at least \$2500 for eligible students to take up exchange opportunities. For more information please visit unisa.edu.au/exchange

For more information please visit: unisa.edu.au/maths

For more information please visit: unisa.edu.au/science

Bachelor of Mathematical Sciences

(Applied Mathematics), (Statistics), (Optimisation)

May Information Sessions

Mawson Lakes campus: Wednesday 25 May

For more information and to register visit

unisa.edu.au/mayinfosessions

Open Day 2011

City West campus: Sunday 21 August

For more information visit

unisa.edu.au/openday

Festival of Innovation

Mawson Lakes campus: Sunday 25 September

For more information visit

unisa.edu.au/innovation

unisa.edu.au/maths

SATAC code	434661
UniSA program code	LBMA
CRICOS code	
(international students only)	057873B / 057872C / 057871D
ATAR (February 2011 cut-off)	97.30
Program length	3 years
Prerequisites	SACE Stage 2 Mathematical Studies
Assumed knowledge	None
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\$) 22,000 per annum
Scholarships available	unisa.edu.au/scholarship

Program overview

Graduates of this program are engaged in activities such as mathematical modelling, data collection and analysis, numerical analysis and computer implementations of solutions within a diversity of employment opportunities. Analytical and problem-solving skills developed in this program are highly valued by prospective employers. Selected students in their final year of study in this program

also have the opportunity to engage in a semester of study overseas on student exchange in the Netherlands.

What will I study?

In the first two years of the program, you will take courses in computing, statistics, operations research and optimisation, numerical mathematics and applied mathematics. In your final year, you have the option of specialising in one of three

areas: Applied Mathematics, Statistics, Optimisation and within each specialisation you have a number of elective courses to choose from. In the final year of the program students taking the Applied Mathematics specialisation are selected on merit to be engaged in the Mathematics Clinic, where one-third of their year involves working on a major project with industry.

The Mathematics Clinic was introduced in 2004 and has since been involved in collaboration with Woolworths Supermarkets, BHP-Billiton and the Electricity Supply Industry Planning Council. Involvement in the Clinic can open up employment opportunities for graduates and make them more aware of the potential applications of mathematics in business and industry.

The School of Mathematics and Statistics has a collaborative relationship with the University of Twente in The Netherlands.

Over the past 10 years, several of our final year students have studied across institutions and all have found their experiences to be both educationally enriching and culturally broadening.

What does it take?

Students with a passing qualification in Stage 2 Mathematical Studies (or equivalent) and a competitive ATAR will qualify for entry into this program. Stage 2 Specialist Mathematics is also recommended. Above all we are seeking prospective students who have ability and a genuine interest in learning more about mathematics.

Our program is well designed to nurture and develop these skills and interests. Successful completion of the Honours program then provides the opportunity for postgraduate study. Testimony to this program and its predecessors is that approximately half of our current group of postgraduate research (PhD) students are graduates from these programs.

Who will employ me?

Specific areas for graduate employment include: The finance sector, which includes banks, financial organisations, insurance and investment companies. Employment opportunities for mathematics graduates in this sector are excellent. The defence sector, including organisations such as the Defence Science and Technology Organisation (DSTO), BAE Systems, Tenix and Australian Submarine Corporation. UniSA has also continued to collaborative research-relationships with DSTO over many years.

Research-based organizations such as the Australian Commonwealth Scientific and Research Organisation (CSIRO), with whom we have a strong working relationship, and the South Australian Research and Development Institute (SARDI). The mining and oil sector including companies such as BHP Billiton. The state and federal public service sectors, including health (statisticians), agriculture (mathematical modelling and statistics) and the Australian Bureau of Statistics.

Honours

Graduates of sufficient merit will have the opportunity to proceed to a further year of study in our Honours program (LHMS).

Additional notes

Scholarships available for this program include the Hypatia Scholarship for mathematically talented women, and entrance scholarships for students who achieve an ATAR of 90 or above in their final year of secondary school study. For further information and scholarship criteria visit unisa.edu.au/scholarship.

Program requirements**FIRST YEAR****First Half****(Study Period 1, 2 or 3)**

Calculus 1

Mathematical Modelling

Problem Solving and Programming

Statistical Methods

Second Half**(Study Period 4, 5 or 6)**

Calculus 2

Discrete Mathematics

Programming Fundamentals

Linear Algebra

SECOND YEAR**First Half****(Study Period 1, 2 or 3)**

Differential Equations 1

Linear Programming and Networks

Statistical Modelling

Real and Complex Analysis

Second Half**(Study Period 4, 5 or 6)**

Numerical Methods 1

Statistical Foundations

Introduction to

Stochastic Processes

Mathematical Communication

THIRD YEAR**First Half****(Study Period 1, 2 or 3)**

Applied Mathematics Stream

Mathematics Clinic 1

Differential Equations 2

Elective

Mathematics Elective

Statistics Stream

Differential Equations 2

Elective

Financial Time Series

Categorical Data Analysis

Optimisation Stream

Optimisation

Differential Equations 2

Elective

Mathematics Elective

Second Half**(Study Period 4, 5 or 6)**

Applied Mathematics Stream

Mathematics Clinic 2

Mathematics Electives

Statistics Stream

Multivariate Statistical Analysis

Statistics Project

Elective

Mathematics Elective

Optimisation Stream

Advanced Operations Research

Decision Science

Elective

Mathematics Elective

MATHEMATICS ELECTIVES**First Half****(Study Period 1, 2 or 3)**

Categorical Data Analysis

Data Structures

Differential Equations 2

Financial Time Series

Mathematics Clinic 1

Operations Research Project 1

Optimisation

Simulation Theory and Application

Second Half**(Study Period 4, 5 or 6)**

Advanced Operations Research

Applied Functional Analysis

Computational Biology

Computer Science Topics for Software Engineers

Decision Science

Investment Science

Mathematics Clinic 2

Multivariate Statistical Analysis

Numerical Linear Algebra

Operations Research Project 2

Statistics Project

This program is currently under review. Please contact the School for further information on course offerings.



Amy Stoianov

Graduated – Bachelor of Mathematical Sciences

'This program is very interesting as it allows you to explore the different areas of mathematics and find where you feel comfortable and would like to specialise during your final year of study. It is challenging at first, but you feel great when you have learnt the tools to solve hard problems.

I have found lecturers are all very helpful when we have questions about course work and they are regularly available for you to talk to them.

I completed a summer vacation program at the Defence Science and Technology Organisation (DSTO), which was a great experience to see one possibility of where my degree could lead me for employment, and I was exposed to a practical working environment.

I was also fortunate to be offered a scholarship for mathematically talented women, which has been beneficial to my studies.'

(08) 8302 2376 or 1300 UNINOW
study@unisa.edu.au

Bachelor of Quantitative Finance

May Information Sessions

Mawson Lakes campus: Wednesday 25 May

For more information and to register visit

unisa.edu.au/mayinfosessions

Open Day 2011

City West campus: Sunday 21 August

For more information visit

unisa.edu.au/openday

Festival of Innovation

Mawson Lakes campus: Sunday 25 September

For more information visit

unisa.edu.au/innovation

unisa.edu.au/maths

SATAC code	424431
UniSA program code	DBQF
CRICOS code	
(international students only)	048563B
ATAR (February 2011 cut-off)	71.70
Program length	3 years
Prerequisites	SACE Stage 2 Mathematical Studies
Assumed knowledge	None
Home campus	City West
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\$) 22,000 per annum
Scholarships available	unisa.edu.au/scholarship

Program overview

This program provides you with a sound professional training in mathematics and statistics where you will develop an aptitude and a greater interest in mathematics and statistics as you progress through the program. There are also opportunities for selected final year students to engage in a semester of study overseas.

A key focus is on the application of mathematics and statistics to solve real-life problems from the

business and commerce sectors and the inclusion of appropriate general knowledge and skills will allow you to pursue a career not just in the finance sector, but in many areas where mathematics and statistics are used. There is a high demand for graduates who have completed this program within fields of applied finance, banking and insurance.

This highly tailored degree provides students with a high level of individual attention

and offers the flexibility to investigate a wide range of financial specialisation courses including actuarial studies.

What will I study?

Throughout the three years of study, you will develop an expertise in mathematics and statistics, with increasing levels of application to specialised areas of quantitative finance, risk management, and actuarial studies. Many of these courses involve learning to use specialised software. The majority courses within this program are offered by the School of Mathematics and Statistics. Courses are underpinned by contextual courses in economics, business and finance offered by the School of Commerce.

What does it take?

You should have a strong interest in mathematics and statistics, and in banking, finance and insurance applications. Those with a passing qualification in Stage 2 Mathematical Studies (or equivalent), and a competitive ATAR, will qualify for entry into this program. However, Stage 2 Specialist Mathematics is highly desirable. If you have a logical, curious and creative mind, and an interest in mathematics and finance, you are encouraged to apply.

Who will employ me?

This program provides career opportunities in many areas of financial application including risk management, financial planning, financial modelling and actuarial science within the banking, insurance, investment and general finance sectors.

Honours

Graduates of sufficient merit will have the opportunity to proceed to a further year of study in our Honours program (LHMS).

Additional notes

Scholarships available for this program include the Hypatia Scholarship for mathematically talented women, the SA Water Hypatia Scholarship, and entrance scholarships for students who achieve an ATAR of 90 or above in their final year of secondary school study and a scholarship for international students studying Quantitative Finance. For more information and scholarship criteria visit unisa.edu.au/scholarship

Program requirements**FIRST YEAR****First Half****(Study Period 1, 2 or 3)**

Calculus 1

Theory of Interest

Statistical Methods

Principles of Economics

Second Half**(Study Period 4, 5 or 6)**

Calculus 2

Problem Solving and

Programming

Linear Algebra

Macroeconomics

SECOND YEAR**First Half****(Study Period 1, 2 or 3)**Linear Programming
and Networks

Differential Equations 1

Statistical Foundations

Business Finance

Second Half**(Study Period 4, 5 or 6)**

Introduction to

Stochastic Processes

Mathematical Communication

Life Contingencies

International Currency

and Banking Markets

THIRD YEAR**First Half****(Study Period 1, 2 or 3)**

Financial Time Series

Optimisation

Mathematics Elective

Portfolio and Fund Management

Second Half**(Study Period 4, 5 or 6)**

Decision Science

Elective

Risk Theory

Investment Science



Karina Mignone

3rd year Bachelor of Quantitative Finance

'At school I was good at and enjoyed maths. I looked for a program that combined maths with something I could relate to, like finance. Quantitative Finance was the perfect solution as it shows how applicable maths is to real-life financial situations.

This degree provides the perfect balance between theory and practical components and many assignments that I have undertaken have involved solving real industry questions. I have also completed a vocational work placement where I used everything that I have learned in my first two years of university. Small classes mean a lot of attention and I am fortunate to be a Hypatia scholarship recipient, which includes financial support and a study office at UniSA.

After I graduate I would like to become a Financial Analyst, using all the mathematical insight I have gained to better understand and tackle the many financial challenges ahead.'

Bachelor of Science

May Information Sessions

Mawson Lakes campus: Wednesday 25 May

For more information and to register visit

unisa.edu.au/mayinfosessions

Open Day 2011

City West campus: Sunday 21 August

For more information visit

unisa.edu.au/openday

Festival of Innovation

Mawson Lakes campus: Sunday 25 September

For more information visit

unisa.edu.au/innovation

unisa.edu.au/science

SATAC code	434201
UniSA program code	LBSC
CRICOS code	
(international students only)	024220A
ATAR (February 2011 cut-off)	60.00
Program length	3 years
Prerequisites	None
Assumed knowledge	SACE Stage 2 Mathematical Studies for the majors and minors in applied physics; SACE Stage 2 Chemistry for the majors and minors in chemistry and biology; SACE Stage 2 Mathematical Studies for the majors and minors in mathematics.
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\$) 22,000 per annum
Scholarships available	unisa.edu.au/scholarship

Program overview

Science is concerned with the systematic study of the nature and behaviour of the physical universe by observation, experiment and measurement. It enables us to model the universe and to make predictions and informed decisions.

This program provides a broad science education through a combination of majors and minors from a variety of science disciplines.

It is also possible to choose one minor from any discipline area in which a minor is offered by the University.

The program produces graduates who have an understanding of the fundamental concepts of the sciences. The emphasis on laboratory and fieldwork is designed to give graduates the necessary skills to apply their knowledge.

What will I study?

The Bachelor of Science is one of the most flexible programs to study at UniSA. Almost the entire program is made up of courses from the student's chosen major and minors. Students can choose their major from the following areas of study:

- » Applied Physics allows students to pursue indepth studies in the areas of advanced materials, computational physics and medical health physics.
- » Biology includes studies into plant and animal biology, cell biology, physiology, environmental biology, biochemistry and introductory biotechnology.
- » Chemistry offers in-depth studies in both physical and inorganic chemistry.
- » Computer Science combines core studies in computer science, information systems, software engineering and internet technology.
- » Environmental Systems provides a broad understanding of environmental sciences and policy, including the contemporary concepts of ecosystem management and sustainable development that link natural and social systems. Students receive a solid foundation in the natural sciences and field research techniques, while engaging in active, project-based learning opportunities.

- » Geospatial Information Systems (GIS) are computerised systems that store and analyse spatial orgeographic data. Data stored by coordinates in 2D, 3D or 4D space are related to relational databases, which can be used to perform spatial queries and analyses.
- » Geoscience is the study of the earth and its resources. This stream introduces the basic concepts of geology and develops these concepts with emphasis on science applications and the practice of geoscience in environmental management and civil engineering.
- » Mathematics provides core studies in applied mathematics, statistics and optimisation.
- » Psychology can be taken as a minor or sub-major. After studies in basic psychology, students may select from further topics for more advanced study.

What does it take?

Students should have an inquiring mind and a keen interest in science. Some knowledge and skills in mathematics, biology, chemistry, physics, or related disciplines are also necessary, depending on the stream in which students wish to specialise. In addition, students must possess a variety of personal skills and qualities to succeed in their chosen profession. Scientists in any discipline need well developed interpersonal abilities, verbal and written communication skills, problem-solving skills, creative thinking and the ability to work collaboratively.

Who will employ me?

Given the broad nature of the scientific field, employment prospects for science graduates are extensive. Graduates may find work in research and development positions in private or government laboratories, the medical and pharmaceutical industries, manufacturing, environmental management, the food and beverage industry, oil and mining industries, information technology, defence science, meteorology, or banking, management and finance industries.

Laboratory and fieldwork in this program is designed to teach students the necessary skills to apply their knowledge in a scientific field of interest.

Honours

Entry to the one year Honours program in Science is available to high achieving students.

Program requirements

FIRST YEAR

First Half

(Study Period 1, 2 or 3)

Communication for Information Systems and Technology

Science major 1

First minor 1

Second minor 1

Second Half

(Study Period 4, 5 or 6)

Statistics for Laboratory Sciences 101

Science major 2

First minor 2

Second minor 2

SECOND YEAR

First Half

(Study Period 1, 2 or 3)

Science major 3

Science major 4

First minor 3

Second minor 3

Second Half

(Study Period 4, 5 or 6)

Science major 5

Science major 6

First minor 4

Second minor 4

THIRD YEAR

First Half

(Study Period 1, 2 or 3)

Science major 7

Elective 1

Elective 2

Elective 3

Second Half

(Study Period 4, 5 or 6)

Science major 8

Elective 4

Elective 5

Elective 6



Rhiannon Schroeder

Graduated – Bachelor of Science

'Whichever science you are interested in, the Bachelor of Science provides the opportunity for you to pursue it as a career. The overall experience is invaluable and designed to allow further research or study in any area of the degree.

All classes have a practical component helping to reinforce the theory presented in the lectures and providing a hands-on learning aspect. I particularly enjoyed the practical sessions in invertebrate and vertebrate biology. This covered dissections, anatomical explorations, phylum collections and animal skull preparation. The third year project enables additional insight into the field of research.

I hope to gain a position, initially with the State Police, and then Federal, working with the crime scene investigators in forensics.'

Bachelor of Science (Advanced Materials)

May Information Sessions

Mawson Lakes campus: Wednesday 25 May

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unisa.edu.au/mayinfosessions

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unisa.edu.au/openday

Festival of Innovation

Mawson Lakes campus: Sunday 25 September

For more information visit

unisa.edu.au/innovation

unisa.edu.au/science

SATAC code	434011
UniSA program code	n/a
CRICOS code	
(international students only)	n/a
ATAR (February 2011 cut-off)	n/a
Program length	3 years
Prerequisites	One or more Science subjects chosen from Chemistry, Physics, Biology and Geology AND one SACE Stage 2 Mathematics subject chosen from Mathematical Methods, Mathematical Studies or Specialist Mathematics.
Assumed knowledge	None
Home campus	Mawson Lakes and/or City East
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\$) 24,000 per annum
Scholarships available	unisa.edu.au/scholarship

Program overview

The Bachelor of Science (Advanced Materials) is a multi-disciplinary science program focused on priority areas for South Australia, namely the Mining, Water, Energy and Health sectors. There are employment prospects locally, nationally and internationally and the program not only provides opportunities

for you to specialise in an area of interest but also to network with prospective employers.

Advanced Materials are all around us, they exist as carbon fibres which are stronger than steel, coatings on glasses that darken when out in the sun, huge bandwidth optical fibre communication systems that

provide all modern media direct to our homes, lasers for eye surgery, materials for long life batteries, next generation solar cells to capture more of the solar spectrum, scratch resistant and protective coatings on mirrors and more importantly, your iPad or iPod, nanoparticles for medical imaging, for targeted radiation therapy and in the future drug delivery. Advanced materials science separates precious metals in minerals processing, to find materials and coatings for implants that are not rejected by the human body, to find solutions to secure fresh water supply and decontaminate soil resources, and to devise systems to store large scale renewable energy for later use.

What will I study?

In first year you will be introduced to core studies in chemistry, physics, biology and mathematics with an emphasis on materials, and be exposed to the potential employment available in Advanced Materials through a research project and participation in a student conference.

In second year core courses include topics in scientific data analysis, materials analysis techniques and instrumentation. Students can choose a major from the following areas of study:

Minerals covers the fundamental science underpinning the characterisation, processing and utilisation of mineral resources (ores, minerals and metals), which is central to the operations of the minerals and materials industry.

Nanomaterials explores the nano world; materials with features less than a micron (a millionth of a meter) in size. The courses provide an understanding of the nanomaterial properties

that enable scientists to design new classes of advanced materials. Nanoscience has far reaching implications for engineering, medicine, physics, biology, energy production and computing to list but a few.

Optical Materials not only looks at lenses, mirrors and coatings, but optical systems such as periscopes on submarines, lasers for eye surgery, microscopes, optical fibre communication systems, lighting solutions, solar cells, surveillance and electro-optic systems.

Water Technology encompasses the development and application of the latest innovative achievements of nanotechnology to benefit the water sector, including desalination, wastewater treatment and reuse, and drinking water purification.

Environmental Remediation is concerned with both the development of innovative technologies for the clean-up of contaminated soils and water as well with the fate of new materials released into the environment.

Energy Technology focuses on the sustainable generation and use of energy through the use of a range of materials with varying physical and chemical properties. Advanced solar thermal and solar photovoltaic electricity generation systems with costs matching conventional energy supply are the key for development of high performance renewable energy power generation plants.

Biomaterials investigates the man-made and naturally occurring biomaterials designed to be used safely inside or in contact with the tissues of the human body.

Chemistry and Pharmaceutical focuses on the use of fundamental chemistry knowledge to areas such as drug delivery, pharmaceutical engineering, and the emerging discipline of nanomedicine.

Medical and Health Physics focuses on studies of nuclear and radiation physics, biomaterials, biophysics and bioengineering.

What does it take?

You should have an inquiring mind with a passion to discover how things work, particularly within the area of material development which is used in new devices and technologies. You need to be able to think scientifically, to critically analyse information and be willing to develop interpersonal and communication skills to become an effective problem solver.

Who will employ me?

Given the broad nature of the advanced materials field, employment prospects for graduates vary across a range of industries in Australia and around the world. Graduates are highly sought by mining and minerals companies, photonics companies, high tech defence companies, government and private research laboratories, water utilities, engineering firms, hospitals and the health care system, radiation protection and environment protection agencies.

Honours

Honours degree programs are available for Advanced Materials graduates with meritorious academic results. Honours requires one additional year of study and can lead to postgraduate research (PhD or Masters) programs.

Additional notes

A study period 5 intake may be available. Please contact the Program Director for more information.

Program requirements

FIRST YEAR

First Half (Study Period 2)

Calculus 1
Applied Physics 1
Chemistry 100, or
Chemistry in Life 100
Biological Science 100

Second Half (Study Period 5)

Linear Algebra
Applied Physics 2
Chemistry 101, or
Chemistry in Life 101
Materials for the Future

SECOND YEAR

First Half (Study Period 2)

Nano & Bio Materials
Computational Science 1
IT Physics
Specialisation Course 1

Second Half (Study Period 5)

Material Science for
Environmental Sustainability
Materials Analysis 1
Numerical Methods 1
Specialisation Course 2

THIRD YEAR

First Half (Study Period 2)

Materials Analysis 2
Computational Science 2
Specialisation Course 3
Specialisation Course 4

Second Half (Study Period 5)

Applied Science Project
Molecules to Materials –
Foundations for Nanochemistry
Specialisation Course 5
Elective



The new \$73 million Materials and Minerals Science Learning and Research Hub (M²) will work collaboratively with UniSA's internationally acclaimed research institutes CERAR, The Wark™ and the Mawson Institute to become a centre of excellence in industry relevant learning, research and innovation. M² will support next generation knowledge transfer to local, national and international industry as it plays a central role in addressing the skills needed for growth in the defence, mining, mineral processing and advanced manufacturing sectors.

Bachelor of Science, Bachelor of Education

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unisa.edu.au/science

SATAC code	434611
UniSA program code	LBES
CRICOS code	
(international students only)	048562C
ATAR (February 2011 cut-off)	62.35
Program length	4 years
Prerequisites	None
Assumed knowledge	For students selecting studies in Applied Physics: Stage 2 Physics and Mathematical Studies
	For students selecting studies in Biology or Chemistry: Stage 2 Chemistry
	For students selecting studies in Mathematics and Statistics: Stage 2 Mathematical Studies
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	No
Program fees	Commonwealth supported
Program fees	
(international students only)	(A\$) 19,000 per annum
Scholarships available	unisa.edu.au/scholarship

Program overview

The Bachelor of Science, Bachelor of Education double degree prepares graduates to become secondary school science and/or mathematics teachers. Throughout the program, students develop the science, laboratory and education skills required to teach effectively in classrooms.

Throughout this program students will develop high level interpersonal skills and abilities in communication and research, which enhance employment opportunities in education and other areas.

In their final two years of study, students will gain a broader understanding of the teaching

environment by undertaking practical placements that focus on both the theory and practice of teaching.

What will I study?

The education components of this program offer a combination of theory and practice, and provide students with opportunities to demonstrate their understanding in school settings. These practicum placements allow students to apply the principles they learn throughout their studies.

Students can choose from a number of professional majors in the sciences, providing them with broad science studies as well as advanced studies in one or more of their chosen professional science disciplines.

The program provides a broad science education through a combination of majors and minors from Applied Physics, Biology, Chemistry, Computer Science, Environmental Systems, Geospatial Information Systems, Geoscience, Mathematics and Statistics, and Psychology. Some of the other courses that students undertake include Educators Work; Social Contexts of Education; and Contesting Curriculum. In addition, they complete a number of elective courses to complement their knowledge and skills within another area of interest.

What does it take?

Teachers need to genuinely care for their students, physically, socially and emotionally, and have a desire for stimulating intellectual growth. They also need to be interested in educating and working with young people as well as having

an ongoing commitment to their own personal and professional development. Teachers must be confident and articulate and able to explain concepts and instructions concisely and accurately. They should possess high levels of literacy and numeracy, as well as be highly skilled and knowledgeable in their chosen field of specialisation. Teachers also require patience, enthusiasm, and sound organisational and communication skills.

Students need to be motivated and self-directed and have a committed and enthusiastic approach to their studies.

Who will employ me?

Graduates will find employment opportunities locally in metropolitan and regional centres, nationally and internationally, in schools and related educational fields. Employers include the Department of Education and Children's Services (DECS) in South Australia, Catholic Education Australia, and Independent Schools Association schools.

Professional recognition

Successful completion of this program provides a recognised academic qualification which will enable graduates to apply for teacher registration in South Australia, interstate and some overseas countries. Applicants should note there are other criteria determining eligibility for registration by the Teachers Registration Board of South Australia and other registration and regulatory authorities. Applicants are advised to check registration requirements as they are subject to change.

Honours

Separate one year Honours programs are available in the Division of Health Sciences or the Division of Information Technology, Engineering and the Environment.

Important information

Applicants are advised that a successful criminal history screening clearance is required for all students prior to their undertaking any professional experience/practicum placement that involves contact with minors (under 18 years of age). Information on the procedure to be followed for obtaining clearance will be provided with the letter of offer or may be viewed at the School of Education criminal history screening web page.

Program requirements**FIRST YEAR****First Half****(Study Period 1, 2 or 3)**

Science major 1

Science minor 1

Science elective 1

Approaches to Learning

Second Half**(Study Period 4, 5 or 6)**

Statistics for Laboratory Sciences 101

OR one of the following three courses subject to the approval of the Program Director:

Statistics for Business

Statistics and Research Methods

Applied Research and Evaluation.

Science major 2

Science minor 2

Free Elective

SECOND YEAR**First Half****(Study Period 1, 2 or 3)**

Science major 3

Science major 4

Science minor 3

Science Education 1

(Curriculum course 1)

Second Half**(Study Period 4, 5 or 6)**

Science major 5

Science major 6

Science minor 4

Science elective 2

THIRD YEAR**First Half****(Study Period 1, 2 or 3)**

Science major 7

Rethinking the Middle Years

Reflective Practice 1

Curriculum course 2

Second Half**(Study Period 4, 5 or 6)**

Reflective Practice 2

Inclusive Approaches to

Diverse Student Needs

Science and Mathematics

Education 2 (Curriculum course 3)

FOURTH YEAR**First Half****(Study Period 1, 2 or 3)****Study Period 1 – Summer**

Education, Change and Society

Study Period 2

Reflective Practice 3

Curriculum course 4

Educators' Work

Second Half**(Study Period 4, 5 or 6)**

Science major 8

Science elective 3

Science elective 4

Contesting Curriculum

**Daniel Emes****4th year Bachelor of Science/Bachelor of Education**

'I have always had a keen interest in science, particularly in physics, and I thought this would be a good career opportunity that would offer some flexibility and variety in future employment prospects.

The program is a fantastic opportunity to hedge your bets if you have not fully decided on doing teaching or a Science degree. There are so many opportunities to follow what you are passionate about within the degree.

I have undertaken a vacation scholarship at UniSA's Ian Wark Institute doing practical research on Micro-fabrication of Metamaterials, along with two practical placements as a student teacher. In the future, I'd like to go on and complete an Honours degree and possibly a PhD in Physics.'

(08) 8302 2376 or 1300 UNINOW
study@unisa.edu.au

Bachelor of Applied Science

(Honours) (Industrial and Applied Mathematics)

May Information Sessions

Mawson Lakes campus: Wednesday 25 May

For more information and to register visit

unisa.edu.au/mayinfosessions

Open Day 2011

City West campus: Sunday 21 August

For more information visit

unisa.edu.au/openday

Festival of Innovation

Mawson Lakes campus: Sunday 25 September

For more information visit

unisa.edu.au/innovation

unisa.edu.au/science

SATAC code	4BH005
UniSA program code	LHMS
CRICOS code	
(international students only)	040651M
ATAR (February 2011 cut-off)	n/a
Program length	1 year
Prerequisites	None
Assumed knowledge	None
Home campus	Mawson Lakes
Accepts Special Entry (STAT)	No
External study available	No
Part-time study available	Yes
TAFE credit available	No
Program fees	Commonwealth supported
Program fees (international students only)	(A\$) 22,250 per annum
Scholarships available	unisa.edu.au/scholarship

Program overview

This program provides advanced coursework and a major industrial, scientific or commercial project in applied mathematics. It will prepare students for postgraduate studies or for employment in industrial, scientific or commercial environments. The program will also enhance students' planning and problem solving capabilities.

What will I study?

The program provides you with an opportunity for advanced study and research within the disciplines of applied mathematics, statistics and quantitative finance. The topics covered in the program may include: Simulation Theory and Application, Advanced Complex Analysis, Nonlinear Programming, Discrete Optimisation, Applied Functional Analysis, Advanced Topics in Applied Statistics, Numerical Linear Algebra, Introduction to Partial Differential Equations, Computational Biology, Stochastic Calculus, Advanced Operations Research, Optimal Control, Advanced Topics in Applied Mathematics, Advanced Topics in Optimisation and Advanced Topics in Quantitative Finance.

What does it take?

Students should have an inquiring mind and a keen interest in science, mathematics, statistics, banking, finance and insurance applications.

In addition, students must possess a variety of personal skills and qualities to succeed in their chosen profession. Scientists in

any discipline need well developed interpersonal abilities, verbal and written communication skills, problem-solving skills, creative thinking and the ability to work collaboratively.

Who will employ me?

There are excellent careers for graduates in environmental modelling, defence research, finance, statistical analysis and optimisation. Graduates with an honours degree are highly regarded by industry and are also ideally qualified to proceed to postgraduate degrees by coursework or research.

Program requirements

FIRST YEAR

First Half

Honours Mathematical Studies 1

Honours Mathematics Project 1

Second Half

Honours Mathematical Studies 2

Honours Mathematics Project 2



Bachelor of Science

(Honours)

SATAC code	4BH009
UniSA program code	LHSC
CRICOS code	
(international students only)	045411J
ATAR (February 2011 cut-off)	n/a
Program length	1 year
Prerequisites	None
Assumed knowledge	None
Home campus	Mawson Lakes
Accepts Special Entry (STAT)	No
External study available	No
Part-time study available	Yes
TAFE credit available	No
Program fees	Commonwealth supported
Program fees	
(international students only)	(A\$) 23,250 per annum
Scholarships available	Provided by the Wark Institute

Program overview

The Bachelor of Science (Honours) program provides an opportunity for advanced study and introductory research experience in a science discipline. The program is primarily for high achieving students, preparing them for postgraduate research or for employment as professional scientists. Students of this program may apply for scholarships offered by the Ian Wark Research Institute.

What will I study?

This honours program consists of several core courses in research project preparation which will provide you with the skills and knowledge to conduct effective research projects. You are required to complete an advanced year-long project in the disciplines of nano and bio-materials. Students interested in studying for Honours in other areas of science should consider one of the following programs in Applied Physics, Mathematics or Statistics, Computer Science, Biology or Chemistry, Biotechnology or Biomolecular Chemistry, Environmental Systems, Environmental Remediation, Geoscience or Geospatial Information Systems.

What does it take?

Knowledge and skills in mathematics, biology, chemistry, physics, or related disciplines are necessary, depending on the stream in which you wish to specialise. In addition, you must possess a variety of personal skills and qualities to

succeed in your chosen profession. Scientists in any discipline will need well developed interpersonal abilities, verbal and written communication skills, problem-solving skills, creative thinking and the ability to work collaboratively.

Entry into this Honours program will be available to students who have successfully completed a Bachelor degree in a relevant field of science, technology or engineering. Applicants should have displayed a high level of academic achievement throughout their degree program achieving a credit level average.

Who will employ me?

Graduates of this Honours program find employment opportunities within companies invested in the development and research of future technologies. Graduates may find positions in the areas of product development, quality control, consultancy or undertake professional scientist and research positions in the field of nano and bio-materials.

Program requirements

FIRST YEAR

First Half

Research Project Preparation
Advanced Topics in Materials and Interfaces 1

Honours Research Project 1

Second Half

Advanced Topics in Materials and Interfaces 2

Honours Research Project 2

Bachelor of Applied Science

(Honours) (Applied Physics)

SATAC code	4BH003
UniSA program code	LHPC
CRICOS code	
(international students only)	n/a
ATAR (February 2011 cut-off)	n/a
Program length	1 year
Prerequisites	None
Assumed knowledge	None
Home campus	Mawson Lakes
Accepts Special Entry (STAT)	No
External study available	No
Part-time study available	Yes
TAFE credit available	No
Program fees	Commonwealth supported
Program fees	
(international students only)	(A\$) 23,250 per annum
Scholarships available	Provided by the Wark Institute

Program overview

The program is designed to provide advanced study opportunities and introductory research experience for high ability students in Applied Physics. The program will prepare you for postgraduate study or for employment in an industrial research and development position.

What will I study?

The program consists of lectures, seminars, readings and a research project. The lecture outline consists of five core courses in Spectroscopy, Solid State Physics, Signal Analysis and Processing, Nanomaterials and Laser Light Scattering and three elective courses. Topics vary to give you an insight into the field of Applied Physics. The research project may be carried out in one of the Applied Physics research laboratories, other University research laboratory or in an external laboratory in the case of a collaborative project. Research projects are often published in scientific journals or at industry related conferences.

What does it take?

Students will normally have a degree in Applied Physics or an equivalent qualification, with meritorious performance in undergraduate studies.

Who will employ me?

Honours graduates are recognised as high calibre students who have excelled in their undergraduate degree, done some advanced coursework and have had some

hands-on research experience.

The Honours year enhances your employability with organisations like CSIRO, DSTO (Defence Science and Technology Organization) and technology companies like those found in Technology Park or Edinburgh Park.

With an Honours degree you will also be able to begin training in high demand areas such as Medical Physics. Career prospects and promotion are also enhanced in teaching if you have an Honours degree. Honours is a pathway to postgraduate studies in research (Masters or PhD) which can lead to a career in research in a University, government institution or private technology organisation.

Program requirements

FIRST YEAR

First Half

Honours Applied Physics
Research Project 1

Honours Applied Physics Topics 1

Second Half

Honours Applied Physics
Research Project 2

Honours Applied Physics Topics 2

Entry requirements

For Undergraduate Bachelor Degrees and Associate Degrees

Applicants are required to have:

- » Completed SACE;
- » Completed at least 80 credits of SACE at Stage 2 of which 60 must be Tertiary Admission subjects (TAS) and the other 20 either TAS, Recognised Studies or a mix of the two;
- » Completed any prerequisites for your chosen program;
- » Obtained a competitive ATAR;
- » Completed interstate or overseas qualifications that the University considers equivalent to the SACE;
- » Completed the International Baccalaureate Diploma;
- » Completed or partly completed a recognised higher education program at a recognised higher education institution;
- » Completed at least four Open Universities Australia (OUA) courses at the appropriate level;
- » Completed an award from TAFE or from another registered training organisation at AQF Certificate IV or above;

- » Qualified for Special Entry and completed the Special Tertiary Admissions Test (STAT). A personal competencies statement and/or employment experience may also be considered;
- » Completed the University Foundation Studies program.

Please note that some programs have prerequisites. Applicants should check all entry requirements before applying. For some programs, applicants may also be required to attend an interview or present a folio.

For more information on entry requirements, visit unisa.edu.au/future

Participation and Access

UniSA offers various programs and services to assist rural and/or socio-economically disadvantaged students, Indigenous Australians and people with a disability. For more information, contact (08) 8302 2376 or 1300 UNINOW or email study@unisa.edu.au

UniSA Advantage

UniSA Advantage is a bonus points scheme that encourages participation in education as well as rewards achievement in selected Year 12 subjects that better prepare students for university study. The scheme includes two strands – **Achievement** and **Aspire**.

Achievement bonus points will automatically be awarded if students score a C or better in Year 12 Tertiary Admission Subjects (TAS) relevant to their intended UniSA program. Find out more here www.unisa.edu.au/future/year12/bonuspoints

Aspire bonus points are awarded automatically to students who attend a school recognised by UniSA as 'under represented' with respect to students going on to higher education. Students from rural and remote areas are also eligible for automatic bonus points while those students on School Card (or state equivalent) and/or Youth Allowance, and do not attend a recognised school, can apply for bonus points by downloading an application form at unisa.edu.au/future/year12/bonuspoints

For more information, visit unisa.edu.au/future/year12/bonuspoints. You can also contact Future Student Enquiries by phone (08) 8302 2376 or 1300 UNINOW (local call cost) or email study@unisa.edu.au

Student contributions

Student contributions are the amount you pay towards the cost of your program. The University determines the amount that you contribute within a range set by the Australian Government. The contribution that applies depends on which courses you choose to study and the contribution band in which those courses are classified. The amount of your student contribution also depends on the unit value of your courses of study (the equivalent full-time student load (EFTSL) value of the course).

As per the Australian Government guidelines, the student contribution amounts for 2011 are:

Band	Fields of study	Student contribution
National priorities	Mathematics, statistics, science	\$0 – \$4,355
Band 1	Humanities, behavioural science (including clinical psychology), social studies, foreign languages, visual and performing arts, education, nursing	\$0 – \$5,442
Band 2	Computing, built environment, health (allied health and other health), engineering, surveying, agriculture	\$0 – \$7,756
Band 3	Law, dentistry, medicine, veterinary science, accounting, administration, economics, commerce	\$0 – \$9,080

Note: These amounts are for 1 EFTSL in 2011. The student contribution amounts for 2012 will be advised by the Federal Government in October 2011, and these will be available to view via unisa.edu.au/future/fees at that time.



UniSA

unisa.edu.au/careershop

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The University of South Australia reserves the right to alter, amend or delete any program, fee, course, admission requirement, mode of delivery or other arrangement, without prior notice.

CRICOS provider number 00121B

Information correct at time of printing, April 2011.