Welcome

The University of South Australia’s Division of Information Technology, Engineering and the Environment has a proud history of furthering education and research in the fields of science and technology to promote innovation in our local South Australian community, in Australia and internationally.

Our division’s home at the Mawson Lakes campus of the University is located in the state’s technology hub, sharing a precinct with key technology organisations in Technology Park Adelaide. Our proximity to innovative industry is not limited to our location – our programs and research are industry aligned and focused on real-world outcomes of great significance to our community.

The Mawson Lakes campus hosts a number of the Commonwealth’s Cooperative Research Centres, which tackle issues of great relevance to all Australians and citizens of our planet. These include responsible use of our natural resources and low carbon living, remediation of the damage we cause to the environment through industrial activity, improved outcomes in chronic (non-healing) wounds that affect half a million Australians, new medical therapies for incurable diseases involving cells, new technologies to improve sight and advanced manufacturing (automotive).

Encompassing teaching, research and consultancy in the areas of science, information technology, engineering, mathematics and the natural and built environments, our three schools, three research institutes and seven research centres work closely, and often in cross-disciplinary teams, to produce outstanding learning outcomes and research results.

As a testament to the quality of our research, our division’s disciplines were rated as world-class or above in the 2012 Excellence in Research for Australia assessment. We excelled in:

- Chemical sciences, including physical chemistry;
- Engineering, including electrical and electronic engineering; mechanical, materials and civil engineering; resources engineering; and extractive metallurgy;
- Mathematical sciences, including applied and pure mathematics;
- Environmental sciences;
- Information computing sciences, including artificial intelligence and image processing, distributed computing and information systems;
- Built environment and design, including urban and regional planning.

The researchers who produced these outstanding ratings are also engaged directly in the teaching and learning of undergraduate and postgraduate students. Our students have many opportunities to work directly with industry, and by learning from researchers who are engaged in the latest technological and developmental innovations, their education is holistically focused on their readiness to contribute to their future career, their profession, industry and their whole community.

Thank you for your interest in the Division of Information Technology, Engineering and the Environment. I hope you find this is a useful resource to discover more about our teaching and research strengths.

Professor Robert Short
Pro Vice Chancellor: Division of Information Technology, Engineering and the Environment
Schools

The Division of Information Technology, Engineering and the Environment is the University of South Australia’s flourishing technology and innovation hub and a vibrant nexus for economic, industrial, social and environmental development. The three innovative schools offer experiential learning through engagement with industry, government and the community. Graduates are skilled professionals who can use the latest technologies intelligently to create sustainable solutions for our fast-changing world.
School of Engineering

A hub of innovation and ideas, producing high-achieving professionals and breakthrough research into solutions that have the potential to help shape and improve our world, making it safer and cleaner.

The School of Engineering is focused on producing engineering, aviation and human factors professionals and undertaking research that addresses global and uniquely Australian opportunities in security, energy and agriculture.

Undergraduate teaching centres on the disciplines of material science, mechanical, mechatronic, metallurgy and electrical and information engineering and aviation. All undergraduate bachelor programs satisfy the requirements for graduate membership of Engineers Australia and comparable international institutions through the Washington Accord. Throughout their course of study, undergraduate students participate in hands-on design projects, providing them with the opportunity to develop links with industry and extend their skills, knowledge and practical experience in their specialised fields.

The School’s postgraduate focus is on engineering management, systems engineering, human factors in design and occupational health and safety. A strong industry focus is also a hallmark. An indicator of the strength of the program suite is the significant number of undergraduate students who continue on with postgraduate study at masters and doctorate levels.

The School has strong links to the Barbara Hardy Institute, Mawson Institute, Defence and Systems Institute, Ian Wark Institute and the Institute for Telecommunications Research. These collaborations bring together internationally recognised research concentrations in sustainability, energy and resource-saving techniques; agricultural machinery and farming systems; telecommunications systems; minerals and materials science; autonomous systems; systems engineering; scientific and technological innovation for Australian manufacturing; and the generation, processing, transfer, conversion and control of energy and information.

In 2012 the Engineering discipline was awarded a Rating of 4, which is ‘above world standard’ in the Excellence in Research for Australia (ERA) rankings initiative of the Australian Government.

Disciplines

Mechanical Engineering

Mechanical engineers are involved in designing and maintaining mechanical systems which may include engines, vehicles, fans, pumps, refrigeration systems and manufacturing processes. Fittingly then, the mechanical engineering program has specialisations in advanced manufacturing, mechatronics, sustainable systems and systems engineering as well as an engineering degree in metallurgy in conjunction with Curtin University.

Electrical and Information Engineering

Electrical and electronic engineers work with energy and information. They are involved with the generation and distribution of electricity plus the electronic control and instrumentation now so fundamental to our lives. Graduates have a strong appreciation for both efficiency and the environment.

Programs have specialisations in computer systems, electronics, mechatronics, renewable energy, systems engineering and communications.

Mechatronic Engineering

The specialisation of Mechatronics is an interdisciplinary area of engineering that integrates mechanical engineering with electrical engineering and computer science. The program provides students with real-world experience. Assistance is provided to complete the required number of flying hours through programs such as scholarship, training and industry qualifications.

Human Factors

The School of Engineering hosts a world-leading set of postgraduate coursework programs in human factors and safety management systems. The programs draw on international research expertise and use innovative delivery mechanisms to create a benchmark in human factors postgraduate teaching. The programs are designed for a diverse student group, including those working full or part time, made possible through interactive online course materials and optional on-campus workshops.

Material Science

The science degree specialising in Advanced Materials is a multidisciplinary program focused on priority areas for South Australia, namely the mining, water, energy and health sectors. The program examines microstructures and properties of materials. It is a rapidly growing area of science and brings together knowledge from various disciplines to develop new materials.
School of Information Technology and Mathematical Sciences

Under the one umbrella, the fields of Information Technology and Mathematical Sciences create a powerhouse of high calibre teaching, learning and cutting-edge research.

The School is the largest Information and Communication Technology (ICT) and Mathematical Sciences education provider in South Australia and offers a wide range of programs. These are diverse and future focused so that students learn to create, innovate and think laterally in developing solutions to complex problems and real world issues affecting organisations in every industry, from science and engineering through to business, libraries and records management.

In addition to a dynamic, multidisciplinary teaching and research base, opportunities for collaborative research and engagement with industry are available via links with our research centres:

- Advanced Computing Research Centre (ACRC)
- Centre for Industrial and Applied Mathematics (CIAM)
- Phenomics and Bioinformatics Research Centre (PBRC)

Our staff actively engage with the community via:
- Mathematics outreach program;
- Industry projects and placements;
- Consulting with the community, business and industry.

Disciplines

Information Technology

The undergraduate IT programs contain a common first year set of core courses which lay the foundations and ready students for the specialisation of their choice: Generic, Cloud Computing, Games and Entertainment Design, Networking and Security, Software Development, Systems Administration, Software Engineering and Multimedia. The final year includes a capstone project with industry.

The high profile and unique postgraduate programs on offer have been developed in conjunction with key industry and university staff both from within Australia and internationally: Doctor of IT Management, Library and Information Management, Cyber Security and Forensic Computing, Business Information Systems, Business and Information Management, Information Communication Technology and the new Master of Data Science. Within these programs, students undertake a capstone project and some include a minor thesis.

The high tech learning facilities include: a CISCO networking academy lab, Innovation Studio for ICT projects incubation, Mac lab, Wearable Computer lab and Information Assurance Forensic lab. These facilities ensure students work with state-of-the-art technology to enhance their learning and gain practical experience.

Mathematics and Science

The Bachelor of Mathematical Sciences allows students to develop high level problem solving and analytical skills which are highly valued by prospective employers. Specialisations include: Applied Mathematics, Optimisation and Statistics.

The Bachelor of Science provides students with a broad science education through a combination of a major and minor chosen from a variety of science related disciplines including: Biology, Physics, Mathematics, GIS, Psychology, Chemistry, Computer Science, Environmental Systems and Geoscience.

An innovative Mathematics Clinic allows students to work with high profile businesses. Students work in teams of three to five and collaborate on challenges sourced from industry, government or not-for-profit organisations. The group structure and industry exposure provides valuable work-ready, technical and managerial experience.

The School is home to Australia’s first Industry Doctoral Training Centre. Through innovative industry based research projects in applied mathematical and statistical techniques, PhD students gain valuable experience via diverse projects: solar and electric cars, plant ontology, solar lighting, air traffic management, drug evaluation, image analysis, scheduling and environmental modelling, biomathematical modelling and operations research.
The School of Natural and Built Environments is located across two campuses: City East and Mawson Lakes. Established in 2004, the School focuses on the unique relationships and synergies between natural and built environments. Its particular interest is in teaching and research to support improved environmental and socioeconomic sustainability.

The School’s civil engineering program was ranked first in Australia in the 2012 Graduate Course Experience Questionnaire.

Civil Engineering

Civil engineering programs are project based and industry focused. Sourced from industry advisors, the projects enable students to apply the theory learnt in a practical way. The degree programs are structured so that students can undertake a broad-based civil engineering degree, or choose a specialisation in the areas of environmental, project management, structural, transport or water resources management.

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Construction and Project Management

The construction management degree is the only one of its kind in South Australia and carries Australian and international accreditation. The degree program offers study specialisation in three distinct areas: construction management, construction economics (quantity surveying) and building surveying. The project management programs offer postgraduate level teaching in generic project management principles and knowledge that can be applied across various industries, such as IT, construction, engineering, defence, finance, biopharmaceuticals, the arts and community development.

Environmental and Geospatial Sciences

The development of new government services, private business and community activities reflects the growing interest in recent years in caring for the environment. The environmental science degree demonstrates our strong commitment to field studies and the way we integrate subjects such as ecology, soil science, geography, geospatial analysis, and society and the environment. Geospatial science offers a blend of the fundamentals of geospatial science with applications in environmental management and modelling and is a pathway into the state’s only Master of Surveying.

The School’s urban and regional planning program was ranked second highest in Australia in the 2012 Graduate Course Experience Questionnaire.

Urban and Regional Planning

The urban and regional planning program is the longest established town planning program in Australia, with a history of educating planning professionals spanning more than 60 years. This background, along with a world-class ranking for research recognised by Excellence in Research Australia and international recognition and accreditation by the Planning Institute of Australia, provides a stellar foundation for graduate success.

This priority reflects South Australia’s Strategic Plan, which seeks to make the state ‘world renowned for being clean, green and sustainable’. In this, the School continually updates programs in line with emerging global knowledge and expectations.

The name alone alludes to the synergies associated with the natural and built environments, exploited through a diverse and coordinated academic program and a stimulating and well-resourced research environment. Indicative of this fact is that the School has been awarded more than 10 Australian Research Council grants over the past five years.

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The School’s urban and regional planning program was ranked second highest in Australia in the 2012 Graduate Course Experience Questionnaire.
The research institutes and centres are the platform for the Division of Information Technology, Engineering and the Environment's standing as a research leader, with a national and international reputation as a dynamic, vibrant and connected research organisation, committed to producing high-quality outputs relevant to real-world situations.

The division's intellectually rigorous research environment encompasses three research institutes and seven research centres, and a growing number of specialised research groups and individuals that are engaged in collaboration with some of the world's best research institutions.

The multidisciplinary research teams comprise more than 300 academic researchers and more than 320 PhD students located between the Mawson Lakes and City East campuses. Their intention: to deliver high-quality outcomes that have demonstrable social, environmental or economic impact for our partners, industry and society.

The research is based – technically and socio-technically – in the following disciplines:
- Physical and chemical science;
- Urban and regional planning;
- Construction management and economics;
- Project management and logistics and supply chain management;
- Environmental science, materials science and nano-biotechnology;
- Electrical and electronics, mechanical, civil and transport engineering;
- Mathematics and statistics, computer science, library information management and information technology;
- Physical and chemical science;
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This innovative institute is one of Australia’s foremost research centres on advancing solutions to the complex human and technical issues involved in developing more environmentally sustainable communities.

The Barbara Hardy Institute brings together world-leading researchers dedicated to ecologically sustainable development, biodiversity conservation, environmental valuation, renewable energy production and use, and maintenance of the natural processes that sustain life.

The Institute for Telecommunications Research (ITR) is an innovator in the field of wireless networks and communications. Partnering with industry and government, the ITR delivers key benefits to society in the following areas:

- Satellite communications;
- High-speed data communications;
- Flexible radios and networks;
- Computational and theoretical neuroscience.

As the largest facility of its type in Australia, the ITR is able to offer high-quality, industry-relevant research and excellent postgraduate opportunities.

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- Flexible radios and network layer, and across the spectrum of activities from theoretical and mathematical research through to the implementation, demonstration and deployment of communications devices and systems.

The ITR’s active research includes coding and information theory, communications signal processing, applied signal processing and telecommunications networks and services. In addition, the ITR undertakes computational and theoretical neuroscience research, an exciting area investigating how the brain represents and processes information.

Project highlights include:

- The Global Sensor Network, a two-way satellite messaging system, which has the potential to reduce the cost of ground-based remote data sensing for applications such as environmental monitoring, livestock tracking, mining equipment monitoring and national security.
- The creation of advanced vehicular wireless communications technology, now being developed for the market by spin-off company Cohda Wireless.
- World-first implementation of turbo codes in commercial satellites.
- The development of on-board satellite communications payloads.
- Coding methods for mobile wireless systems to improve bandwidth and power efficiency.

Research facilities include:

- An Advanced Prototyping Laboratory, with a focus on Software Defined Radio to enable transition from theoretical and algorithmic outcomes to proof-of-concept demonstrations.
- Satellite ground stations (incorporating 6.8m X-band, 3.0m S-band and UHF/VHF capability) on site.

Graduates of ITR have launched successful careers across the globe in industry and academia. Several have won prestigious awards, including Young Tall Poppy of the Year, Young Entrepreneur of the Year and Young Engineer of the Year.
Research Centres

A number of elements underpin the Division’s research centre ethos but principally it is to foster a diversity of ideas, generating significant advances in technologies, theories and applications of knowledge. The research centres are involved in advancing knowledge to address the needs of a changing world, and the Division is home to seven of the University’s 17 centres.

Through its capacity to work across a range of science and engineering disciplines, The Wark™ optimises creativity and produces unique ideas that advance global knowledge and understanding.

The Ian Wark Research Institute, or The Wark™, was named in recognition of the eminent Australian scientist, Sir Ian William Wark (1899–1985), and has been a proud and integral part of the University of South Australia since its establishment in 1994. The Institute’s structure combines academic rigour and inquiry and is driven by industry needs and value to society.

The Wark is distinctive in its creative and flexible approach to research and development. Its fundamental and applied research is focused on chemistry and physics at interfaces that cover a wide range of areas, including bio and polymer materials, colloids and nanostructures, and mineral processing applications.

The Institute uses openness as a fundamental principle for enhancing its academic excellence. It continues to forge ahead with research discoveries, postgraduate education, national and international linkages, and scientific outputs and outcomes. Among other important achievements, The Wark holds a unique position in Australian research as the designated Australian Research Council Special Research Centre for Particle and Material Interfaces.

A major function of the Institute is the education of graduate students. At The Wark, students are encouraged to think and work together with staff and other students and thereby exchange knowledge and ideas in a stimulating and rewarding environment. It brings together talented individuals from different generations, cultures and scientific disciplines to work towards common goals by consciously shifting between focused and reflective ways of working.

Students are involved in research projects that make a difference; delivering solutions to real-world problems from industry or delving into some of the fundamental questions of science. The Institute has an excellent graduate employment record, with more than 175 graduates employed in industry, government or other higher education institutions around the world.

The Wark is a major contributor to the University’s research in Physical Chemistry and in Resources Engineering and Extractive Metallurgy - both received ratings of 5 in the 2012 Excellence in Research for Australia (ERA) assessment, indicating outstanding performance well above world standard in these areas. It also has a central role in the University of South Australia’s new Materials and Minerals Science Learning and Research Hub at the Mawson Lakes campus.
Advanced Computing Research Centre

The Advanced Computing Research Centre (ACRC) research focus is to advance the state-of-the-art in computational modelling, visualisation, and analysis of our world in order to provide comprehensive ICT solutions for challenging problems relevant to industry, government and society.

The ACRC is integral to the University of South Australia’s School of Information Technology and Mathematical Sciences (ITMS). The Centre’s research combines the expertise from three complementary areas, combining three basic concepts: Visualise - Model – Understand. These are represented by three major areas of research: Intelligent Software Engineering, Visualisation and Augmented Reality, and Data Analytics and Business Intelligence. ACRC’s capability in these fields is applied in many different areas such as the ICT industry, business, health and medical processes; genetics data curation and classification; engineering and manufacturing; power, oil and gas; defence and security.

The research is conducted in first rate research labs including a state-of-the-art $3 million projector-based visualisation laboratory.

ACRC research expertise includes:
- software engineering, information and knowledge modelling;
- interoperability and architectures for large scale software ecosystems;
- knowledge representation and ontologies;
- product configuration and diagnosis;
- business process modelling and management;
- web content analysis;
- spatial and mobile augmented reality;
- large-scale visualisation;
- wearable devices;
- reconfigurable processors;
- augmented reality support for interactive artworks and games;
- business intelligence evaluation and support;
- data and information quality assessment and improvement;
- information capability assessment;
- data capture and metadata management;
- data mining and causal analysis;
- predictive modelling;
- digital forensics and cybercrime;
- social network modelling.

ACRC research is delivered in partnership with Australian organisations such as DSTO, ANSTO, DMO, VPAC, many industry partners from 10 countries on four continents, and involves collaborations with research organisations in the US, Canada, Germany, the UK, Finland, Austria, Japan, the Netherlands, and other countries.

Centre for Environmental Risk Assessment and Remediation

At the forefront of research and innovation in Computer Science, Software Engineering and Information Systems.

Australia’s leading science-based centre for research into the protection of the nation’s health and natural resources.

The Centre for Environmental Risk Assessment and Remediation (CERAR) research focus is to deliver innovative solutions and technologies for the assessment, remediation and management of contaminated urban, industrial and mine sites in Australia and the Asia-Pacific region, and the sustainable management of waste for beneficial use. To achieve this goal, CERAR brings together an interdisciplinary approach for solving real-world environmental problems. The delivery of these solutions is based on solid fundamental and end-user inspired applied research.

It is estimated that 10 million tonnes of toxic chemicals are released into the environment every year as a consequence of anthropogenic activities. New chemicals are constantly being produced, and it is essential that the dynamics of these chemicals in the environment are assessed in order to quantify the potential risk to human and environmental health.

The most common approach to remediation includes excavation and transportation of soils to prescribed landfill sites, pumping and treating contaminated water and occasionally soil treatment technologies, including bioremediation. Practical remediation is often constrained by the costs associated with treatment technologies. CERAR’s strengths lie in the application of fundamental and applied research and the interdisciplinary expertise in biogeochemistry, contaminant chemistry, ecotoxicology, environmental biotechnology, hydrogeology, resource recycling and nanotechnology. These disciplines are essential in developing sustainable environmental solutions to real-world environmental problems.

To undertake environmentally focused research, CERAR has established expertise in the following areas:
- Risk based land management;
- Contaminant life cycle assessment;
- Waste characterisation;
- Speciation and toxicity assessment;
- Ecological and human health risk assessment;
- Bioaccessibility/bioavailability assessment;
- Innovative remediation methods for contaminated soil and ground water;
- Risk communication;
- Specialised analytical testing;
- Specialised services including treatability studies for remediation;
- Remediation treatability studies.

CERAR seeks to provide commercially viable and cost effective solutions to environmental contamination that benefit industries, regulators, policy makers, consultants and academics within Australia and abroad.

Its primary mission is to enhance Australia’s economic, environmental and social sustainability and boost its international competitiveness through high quality strategic and tactical research in key areas of natural resource regeneration.
Projects are as varied as applying mathematics to motor vehicle emissions, credit migration and the El Niño weather pattern. The Centre is connecting leading research to real-world application.

Mathematics is an enabling discipline that underpins science, engineering and technology. The Centre for Industrial and Applied Mathematics (CIAM) brings together the University’s researchers in pure and applied mathematics to:

- discover, understand and interpret natural phenomena;
- apply mathematics to important industrial and social problems;
- advance mathematics and its applications;
- develop new research strengths in mathematics and statistics.

CIAM research themes include:

- Modelling of chemical and physical phenomena and processes, including fluid flows, electrokinetics and reaction-diffusion;
- Finance, risk and stochastic modelling, including environmental modelling;
- Scheduling and control, applied optimisation and operations research;
- Mathematical analysis, including theoretical and numerical optimisation, optimal control, singular perturbation analysis, complex analysis, harmonic analysis, and signal and image processing.

The Centre’s research is supported by ARC Discovery Grants, Linkage Grants, and by Cooperative Research Centres and industry and is also a partner centre of the Industry Doctoral Training Centre: Mathematics and Statistics. Through innovative industry based research projects in applied mathematical and statistical techniques the Doctoral Training Centre provides PhD students the opportunity to gain valuable experience via diverse projects: solar and electric cars, solar lighting, air traffic management, drug evaluation, scheduling and environmental modelling, and operations research.

The Defence and Systems Institute (DASI) is integral to the School of Engineering. The Institute blends academic excellence with high-quality applied research, bringing academic, industry and defence experience to solving problems taking into account the entire system development and deployment cycle.

Its innovative research and quality teaching and training is aimed at allowing the viability of complex new technologies, products, practices, infrastructure acquisitions and capabilities to be developed concurrently with the concept of new deployment and service approaches, hence reducing project risk and total system cost.

DASI maintains close relationships and links with major players in the defence industry, including government agencies, industry sectors and small-to-medium size enterprises. It also has collaborative relationships with universities and government research centres in the United States, the United Kingdom and throughout Asia.

DASI conducts research in both ‘hard’ (technologies, products, infrastructure) and ‘soft’ (human, organisational, process) systems, which are sponsored by the ARC, government departments and industry.

DASI’s research comprises a fundamental research program and an applied research program. In combination, the programs target the development of new theories and methods, and the application of these in a variety of targeted industrial and systems contexts.

Research projects include:

- Systems Technologies and Applications: Autonomous and robotic systems, unmanned vehicles, intelligent systems, data fusion, sensing systems, human-machine interfaces, and real time distributed sensing.
- Systems Modelling, Simulation and Analysis: Model-Based Systems Engineering, system dynamics modelling, agent-based modelling, complex systems and systems of systems.
- Systems Methodologies, Tools and Techniques: Systems engineering processes, systems enterprise improvement, technology roadmapping, risk identification, modelling and management, causes of technology project failure, test and evaluation strategies, soft systems methodologies, and cost-benefit analysis.

- Systems Engineering Frameworks: Systems thinking, systems science, multi-research methods, cross-cultural/discipline impacts of systems engineering practice, systems engineering competencies, systems engineering management, systems engineering standards, systems engineering and project management, value of systems engineering, creativity in engineering.
The Mawson Institute’s cutting-edge research is shaping the future of high-tech manufacturing, opening up economic opportunities for the state of South Australia and addressing opportunities and future challenges facing the nation.

The Mawson Institute’s focus is on the science and engineering that underpins next generation manufacturing, providing technology platforms based on new knowledge and innovation that can be readily integrated into products and processes. Scientists and engineers work in parallel on concepts and commercialisation, significantly reducing the time and steps in product development.

In an increasingly complex global environment, today’s manufacturer needs to stay competitive and ahead of the pack. Manufacturers must stay abreast of rapid advances in science and technology; they must keep up with environmental challenges and meet societal needs.

The Institute is home to state-of-the-art, purpose-built laboratories, which support the innovation cycle from concept through to creation, meeting the research and development needs of advanced manufacturers. Core research areas include materials science; surface engineering; nanobiotechnology; biomaterials; tissue engineering; sensor technology; minerals science; regenerative medicine; polymer science; and spatial augmented reality. Rapid advances and convergence in these areas of specialty will lead to new products and production processes that will radically change the scope of manufacturing in Australia.

The Mawson Institute collaborates with leading researchers in science, engineering, information technology and manufacturing and research institutions around the globe, feeding into the rich research and teaching environment. It is also a significant partner in three Cooperative Research Centres: Advanced Automotive Technology, Wound Management Innovation and Cell Therapy; and a significant partner, along with The Wark, in the Materials and Minerals Research and Teaching Hub.

The Phenomics and Bioinformatics Research Centre (PBRC) works to combine the analytical and computational skills of talented applied mathematicians, computer scientists and biostatisticians to support ongoing international research in plant biology. Plant phenomics is the science of identifying, understanding and quantifying physical traits, properties and development of plants that characterise their growth behaviour in different environments.

Bioinformatics in the PBRC is a multidisciplinary endeavour involving the acquisition and subsequent analysis of large volumes of data derived from biological experiments, whether they are genetic, phenomic, metabolic or physiological.

Researchers in the PBRC are involved with the design of plant experiments, the capture and analysis of biological information in the form of images or gene sequence data, and the biophysical modelling of plant processes and growth behaviour.

The Centre’s research into experimental design, mathematical modelling and image processing has far-reaching benefits for the future of plant science.

Working together with colleagues in the Australian Centre for Plant Functional Genomics, the PBRC is helping to identify and characterise new varieties of cereal crops that are more tolerant to the abiotic stress conditions prevalent in Australian farmland. Members of the PBRC are internationally recognised experts in areas such as image processing, computer vision, biometrics, experimental design, applied mathematics and mathematical modeling.

The Centre is also a partner of the Industry Doctoral Training Centre: Mathematics and Statistics, with PhD students engaged on projects in the areas of plant ontology, image analysis and biomathematical modelling.

Through, as well as alongside, applications to plant biology, the PBRC also contributes to the fundamental knowledge base of these underlying disciplines, developing new understanding and novel methodologies that can be applied to a greater variety of real-world problems.
The Centre adds significant expertise to the water research capability in South Australia, advancing the science and technology behind sustainable water management through fundamental and applied research.

The SA Water Centre for Water Management and Reuse (CWMR) was established in 2004 as a joint venture between the South Australian Water Corporation and the University of South Australia. Since its inception, CWMR has added significant expertise and capability in research on water supply and conservation, reuse and recycling in South Australia and Australia. The Centre has built on established strengths in urban water management and reuse and established core capabilities in water supply and conservation, sustainability of water resources and advanced water quality monitoring.

The CWMR complements and works closely with other research concentrations such as the Australian Water Quality Centre within SA Water, Water Research Australia and the Goyder Institute. It also houses the Australian Irrigation and Hydraulics Technology Facility (AIHTF), a unique facility that provides testing to Australian Standards and pattern verification on a range of water delivery products, such as valves, meters and irrigation appliances for a range of Australian and overseas companies.

Through its strong industry connections with many of its adjunct staff sourced from industry partners, the Centre retains a focus on key applied problems facing the water industry and can structure its research portfolio accordingly. SA Water plays a major part in the annual CWMR Research Workshop and the direction of funding to relevant projects.

Many of the problems facing South Australia with regard to water quantity and quality are also faced nationally and globally. The Centre has established strong local, national and international links, with over 40 institutions partnering in its research efforts.

Located in one of Adelaide’s premier developing suburbs, the University of South Australia’s Mawson Lakes campus boasts contemporary teaching, learning and research facilities, manicured green spaces and wetland areas; buzzing cafés; and leisure facilities to ensure students get the most out of their university experience.
The Mawson Lakes campus is well serviced and accessible to a wide range of community services available at the Mason Lakes town centre including shopping, bank services, transport and student accommodation.

With its world-class research and education platforms, the Mawson Lakes campus is underpinning the next generation of science, IT and engineering innovation.

The Mawson Lakes campus – home of the Division of Information Technology, Engineering and the Environment – has state-of-the-art laboratories and international standard research centres and institutes. They are geared to supporting the innovation cycle from concept through to creation, meeting the research and development needs of advancing technologies.

The cutting-edge research being undertaken is helping to shape the future of high-tech manufacturing, opening up economic opportunities for South Australia and improving people’s quality of life. Award-winning research into the application of thin-film coatings for products in the automotive industry and pioneering research into the healing and management of chronic wounds, are just two examples.

Collaborative engagement with industry and research institutions around the globe is integral and, in turn, feeds a rich teaching and learning environment.

The University will continue to be recognised for its high level of innovation through its international linkages with some of the world’s top universities, providing international study and resource opportunities for our students through programs such as Global Experience, Engineers Without Borders, and student exchange partnerships.

Students studying onshore are located at either our Mawson Lakes or City East campuses. In addition a number of our undergraduate and postgraduate programs are delivered offshore, principally in Singapore.

The Division is a diverse and multicultural workplace and study environment, incorporating more than 500 academic and professional staff and approximately 6000 students both on and offshore.

The Division’s highly qualified academic and research staff have practical and advanced academic qualifications, enhancing the University’s reputation for outstanding performance and raising its profile as a national and international education provider.

Attuned to the real challenges of industry and the community, the Division is active in seeking technological solutions that are effective, efficient and sustainable and is progressive in anticipating the future needs of society. The result is a teaching and research leader that is at the forefront of science and technology in Australia.

The Mawson Lakes campus is well serviced and accessible to a wide range of community services available at the Mason Lakes town centre including shopping, bank services, transport and student accommodation.