BIOMEDICAL RESEARCH ADVANCES THROUGH NEW INSTITUTE

The Faculty of Engineering and Information Technologies’ new Institute of Biomedical Engineering and Technology (BMET), launched in March, will significantly advance research in this highly multidisciplinary area of life sciences and medicine.

BMET brings together a team of around 35 researchers within the faculty dedicated to investigating core technologies that can assist in revolutionising the field of biomedical research.

Professor David Feng, Director of Research at BMET, says its research will cover broad areas within biomedical engineering and technology including biomechanics, biomaterials and tissue engineering, biotechnology and biomolecular engineering, biomedical devices and instrumentation, and imaging, visualisation and information technologies.

Continued page 3
DEAN’S MESSAGE

I’m sure you will join me in congratulating over 600 students who graduated from the faculty in May. I’m delighted that this year we had 92 female graduands - a testament to our ongoing commitment to increasing the number of female students in our programs. On page 4 we highlight one such graduand, Ms Merrilyn James, who, with her sisters, Isobel and Rebecca are fine examples of successful females in engineering.

Congratulations also to alumnus Professor Xiao-Ling Zhao (PhD 1993), Department of Civil Engineering at Monash University, who was awarded the degree of Doctor of Engineering.

In addition, Honorary Doctorates were awarded to Dr John Gilmour Nutt AM and Dr John O’Sullivan. Dr Nutt, former Chairman and CEO of OVE ARUP & Partners Consulting Engineers, was recognised for his leading role in engineering design of the iconic Sydney Opera House and his contribution to the reform of building regulations in Australia. Dr O’Sullivan, a research scientist with CSIRO’s Astronomy and Space Science Division, was recognised for his outstanding contribution to astronomy and wi-fi technology.

Earlier this year, we hosted the 2012 Indigenous Australian Engineering Summer School (IAESS). The January program introduced 21 young Indigenous students from across Australia to the wide range of opportunities an engineering degree offers. I am delighted that the faculty will be providing further support to a number of IAESS participants via an Indigenous Student Engineering Workshop program to be held in July. This program is designed to help participating students achieve their full potential and equip them with the necessary skills to successfully transition to engineering studies at university. Students will take part in hands-on engineering activities, cultural excursions and site visits as well as mathematics and exam preparation workshops.

We are continuing to work with Engineering Aid Australia to develop the next IAESS program, which we are hosting again in January 2013.

The faculty is excited about two recent appointments. Firstly, Professor Andy Dong, has accepted the role of Chair in Engineering Innovation supported by The Warren Centre for Advanced Engineering. This newly established chair will lead a program of education and research in engineering innovation in Australia. We are also pleased to welcome Professor David Lowe, who joins the faculty from July 2012 as Associate Dean (Education).

Every year the faculty celebrates the achievements of our distinguished alumni through the annual Alumni of the Year program. Nominations for our 2012 alumni awards are now open and I encourage you to participate by submitting your nominations (see page 8).

Our 2011 Alumnus of the Year winner, Sir David Higgins, Chief Executive of Network Rail UK, will be visiting Sydney in October to receive his award. Sir David will also present the annual Dean’s International Lecture at the Seymour Centre on 8 October. Please join us for what will be an interesting and popular lecture (see page 11).

PROFESSOR ARCHIE JOHNSTON
DEAN
‘With the increasing incidence of obesity, diabetes, cardiovascular disease, cancer and Alzheimer’s disease, combined with the ageing population, there is growing pressure on the medical profession,’ says Professor Feng. ‘BMET will provide significant technological and engineering support to help address these conditions, with innovations that will complement and enhance other fundamental life sciences and clinical research.

‘BMET will play an important role in bridging the gap between core engineering and technology research and the translation of research outcomes into clinical practice or application. For example, our researchers are developing ambulatory solutions using impedance imaging, bio-impedance and bio-potential monitoring to assist in both the rapid diagnosis and the long-term monitoring of heart attacks and strokes.

‘Building on our existing links with institutes across Asia, we want to expand this unique joint interdisciplinary research network internationally.’

Professor Archie Johnston, Dean of Engineering and Information Technologies, adds: ‘We believe that the use of innovative, modern engineering and other technology is an essential element to driving biomedicine into a new frontier of discovery. Our commitment in this area also extends to our biomedical education program. For 2013, we have expanded our undergraduate program to give students a more solid foundation in biomedical engineering and life sciences as well as the ability to specialise in mechanical, mechatronic, chemical, electrical or information technology.’

Professor Andrew Ruys, Director of Biomedical Engineering (Education), says: ‘Biomedical engineering is one of the fastest-growing branches of engineering. We have a large student body of over 250 undergraduate students, as well as about 100 postgraduate students. BMET’s education arm will build on the University’s research endeavours and our 15-year history in undergraduate and postgraduate education in this area.’
FEMALE GRADUATES CLOSE THE GENDER GAP

Mid-year figures show a record number of upcoming female graduates from the Faculty of Engineering and Information Technologies.

According to Associate Dean (Education) Dr Tim Wilkinson, the faculty has experienced a steady increase in the number of female students enrolling and graduating from its many disciplines. ‘While engineering and IT student numbers have increased across the board, 10 years ago the University had as few as 50 female engineering graduates. Last year we doubled that figure. This year, the faculty is anticipating well over 100 female graduates.’

Among our recent female graduates is Merrilyn James, who graduated in May with a degree in power engineering. Her two sisters, Isobel and Rebecca, are current engineering students at Sydney. As part of her coursework Merrilyn investigated the effect of space weather on our power system, particularly power transformers, and whether geomagnetically induced currents cause saturation and even failure of power transformers. ‘An outage due to space weather could be widespread, and it could be expensive to repair supply to all customers,’ says Merrilyn, who now works as a graduate engineer at Ausgrid. She hopes in future to develop these models further.

While women now make up 20 per cent of Australian engineering graduates, only 10.5 per cent of practising engineers are women, despite continuing efforts of academic institutions and employers to address the gender gap.

Professor Archie Johnston says the faculty encourages female high school students to consider the exciting range of engineering and IT careers on offer. The faculty runs a number of outreach programs including the Girls’ Programming Network, which involves one-day workshops run by girls, for girls. Participants develop their own games, learn about digital media and create smartphone applications.

Professor Johnston says that while numbers of female engineering students are increasing and this is encouraging, we cannot be complacent about the issue. ‘Engineers support the growth of all our communities,’ he says. ‘They are creative thinkers who rely on their understanding of mathematics and science as well as their knowledge of business and legal processes to meet the expectations of these communities. We still need to focus on increasing the number of high school students taking higher levels of mathematics and sciences to underpin growth in all of the engineering qualifications.’

SUMMER WORK EXPERIENCE SOUGHT FOR STUDENTS

Every year we seek work experience placements for up to 1000 undergraduate and postgraduate engineering and IT students for the summer holiday period from December to February.

Our students, including our Master of Professional Engineering students, are studying in a wide variety of disciplines including project management, telecommunications, IT, mechatronics and electrical, software, biomedical, aeronautical, civil and chemical engineering.

If your organisation has placement opportunities or can assist our students in any way, please contact:

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NEW APPOINTMENTS:
CHAIR, ENGINEERING SYDNEY

David Stewart, Senior Executive with Laing O’Rourke, has commenced as chair of Engineering Sydney, the faculty’s industry-aligned body that collaborates and develops partnerships with business leaders and organisations.

David, former CEO of Leighton Holdings Ltd, has more than three decades of experience in managing and working in construction operations throughout Australia and South-east Asia, said his acceptance of the role was motivated by his commitment to the engineering profession.

‘I am passionate about engineering, and what better way to follow this passion than by taking up a key role at one of the leading engineering universities in Australia,’ he said.

David believes that education, innovation and research are the keys to future success in Australian engineering.

‘There are many benefits of educational partnerships for industry, including access to top-quality graduates, academic expertise and world-leading research. A partnership is a great way to enhance recruitment, training and research endeavours.

‘Educational institutions are at the forefront of research and development, and industry should work in collaboration with these institutions to progress innovation in a cost-effective and timely manner.’

Professor Archie Johnston said David’s knowledge and experience is an invaluable contribution to the University: ‘We are thrilled to have David join us in this leadership capacity. His extensive knowledge and international connections will further enhance our ability to work with industry and respond to their needs.’

CHAIR IN ENGINEERING INNOVATION,
THE WARREN CENTRE

With a background in mechanical engineering and artificial intelligence, Professor Dong is a distinguished researcher in the areas of computational design and design-led innovation. His research investigates how the design of products influences their potential rate of innovation.

Professor Dong says ‘Businesses are increasingly relying on innovation to succeed. My goal is to produce research to help them figure out how to design or redesign products and services so that they can continually improve. I think this problem applies to all engineering innovations, from consumer electronics to heavy industries.’

Professor Archie Johnston says Professor Dong’s appointment is further acknowledgement that design-orientated innovation in engineering is a crucial focus for the future of the profession and of the industry as a whole. ‘We have introduced a number of innovation and entrepreneurship subjects across our programs in the faculty, particularly at the postgraduate level,’ he says. ‘We want to embed a real culture of innovation, one that is truly integrated with the research aspects of engineering and technology.’

The chair is funded by The Warren Centre for Advanced Engineering. The chairman of The Warren Centre, Chris Vonwiller, says the new role promises significant benefits for Australian corporate enterprises. ‘This will assist Australian corporations to understand the commercial potential of innovation and new engineering technology, and exploit this for wealth creation.’
ALUMNI REUNION EVENTS

CHEMICAL AND BIOMOLECULAR ENGINEERING ALUMNI WINE TASTING

Wine expert and alumnus Julian Todd (BE Chem, 1984), Managing Director of Back Vintage Wines, led an informative and entertaining tasting event for chemical and biomolecular engineering alumni in April.

Julian generously shared his passion and expertise as he guided participants through a selection of more than 20 wines. Alumni and their guests also enjoyed the opportunity to re-visit the School of Chemical and Biomolecular Engineering and network with their fellow graduates.

1965 MECHANICAL ENGINEERS AND ASSOCIATES REUNION

A group of 1965 mechanical engineering graduates and friends from other engineering disciplines enjoyed a reunion lunch by the water at Middle Harbour Yacht Club in March.

The reunion was organised by alumnus Bob Porter (BE Mechanical, 1966), and we thank Bob for his long-term involvement in organising such reunions. Bob and Paul Lin (BE Elec, 1966) are planning a 50-year reunion for all 1965 engineering graduates in 2015.

1972 CIVIL ENGINEERING REUNION

Civil engineering graduates from 1972 gathered at the Royal Sydney Yacht Squadron in May to celebrate their 40-year reunion. Special guests included Challis Professor Kim Rasmussen, Head of the School of Civil Engineering; Emeritus Professor Harry Poulos; and Associate Professor Robert Wheen. We thank Bruce Walker, Peter Thornton and David Mathlin for organising the reunion.

BIOMEDICAL ENGINEERING ALUMNI NETWORKING EVENT

Professor Andrew Ruys, Director of Biomedical Engineering (Education), hosted an inaugural networking event for around 60 biomedical engineering alumni in May, at the Waverton North Sydney Bowling Club. Further events are now being planned, so please join the University of Sydney Biomedical Engineering Alumni group on LinkedIn to keep up to date with all the latest news and events.

For more information, please contact the Alumni Relations Officer (see page 12 for contact details).
Greg spoke about the challenges of delivering engineering projects at one of the world’s best known and busiest performing arts and tourism venues. More than 50 alumni and their guests attended the lecture in the Utzon Room at the Sydney Opera House. Many of the attendees played and continue to have a leading role in the engineering of this iconic building including Dr John Nutt AM (former chairman and CEO of Ove Arup & Partners Consulting Engineers), Mr Robert Leece AM, RFD (member of Sydney Opera House Trust) and Mr Malcolm Patterson, Consulting Project Director for the current construction project.

Greg McTaggart joined the Sydney Opera House in 2003, and prior to his current role was project director of the building development group responsible for planning and delivering all major building projects at the Opera House including the Utzon Room, the Western Colonnade, the Western Foyers and the Opera Theatre Renewal Concept Design Study. In his current role he is responsible for environmental sustainability, security, maintenance and conservation of the building as well as for continued planning and delivery of major building projects.

Alumnus Greg McTaggart (ME, 1986), Director of Building Development and Maintenance at the Sydney Opera House was guest presenter for a special alumni event in the spectacular Utzon Room.

Left to right: Dr John Nutt AM, Mr Greg McTaggart, Director, Building Development and Maintenance, Sydney Opera House and Professor Archie Johnston, Dean, Faculty of Engineering and Information Technologies.

Left to right: Mrs Angela Low, Mr David Low and Mr Jon Pratten

Mr Glenn Erskine and Ms Jo Campbell

The presentation in the Utzon Room
FACULTY OF ENGINEERING AND IT ALUMNI OF THE YEAR AWARDS 2012

Since its beginnings in 1883, our faculty has produced thousands of world-class researchers, industry leaders and innovators working in Australia and overseas.

Our annual Alumni of the Year awards honour the achievements of alumni who have made outstanding contributions to their professions and community.

Nominations for this year’s awards are now open, closing on Friday 12 October. The awards will be presented at Engineering Sydney’s annual Research Conversazione event on Friday 2 November.

Nominations can be submitted through the faculty website at sydney.edu.au/engineering/alumni

For more information contact the Alumni Relations Officer (see page 12 for contact details).

HONOURS

Alumnus Dr Robert Barr (BE Elec, 1977) has been named the National Professional Electrical Engineer of the Year for 2012.

This honour is awarded annually by the Electrical College Board of Engineers Australia to a member of the College who is an outstanding senior electrical engineer at or near the peak of their career. The award is designed to promote good role models for younger members of the engineering profession.

Robert graduated with honours in electrical engineering at the University of Sydney in 1977 after completing a cadetship with Prospect County Council (now Endeavour Energy). He later went on to complete a Master of Engineering and a PhD. Robert’s wife Linda (BVSc 1979) is also a graduate of Sydney.

Robert credits the University with providing the solid grounding in electrical engineering that has propelled him through his career. He attributes much of his success to a combination of very knowledgeable employers and clients, taking an adventurous career path, building a strong network of engineering colleagues, a commitment to lifelong learning and having a very supportive wife and family.

He now operates his own consulting company, Electric Power consulting Pty Ltd, from Culburra Beach on the NSW South Coast. He provides electrical engineering services to a wide range of electricity supply authorities and large electricity users across Australia. He is also the current national president of the Electric Energy Society of Australia and a visiting professor at the University of Wollongong.

ALUMNI ONLINE MENTORING PROGRAM

Sydney alumni have the opportunity to join the Alumni Online Mentoring Program and contribute to current University of Sydney students. No previous mentoring experience is required, simply a desire to share your knowledge and contribute to the career development of a student.

The amount of time you will need to spend will be decided mutually between you and the student.

Students from all faculties are now seeking mentors, and we encourage your participation in the program.

For further information and to register, please visit sydney.edu.au/alumni
REALITY BYTES FOR HIGH SCHOOL TEACHERS

Google has established partnerships with a handful of universities in Australia, including the University of Sydney, to conduct Computer Science for High School (CS4HS) workshops for teachers.

CS4HS aims to increase high school teachers’ knowledge and ability to promote and teach computer science and computational thinking in the classroom. The program takes a ‘train the trainer’ approach. The two- to three-day workshops for teachers provide training, tips and classroom materials to help them teach programming and computing in schools and turn students into computational thinkers and creators.

Dr Bernhard Scholz, of the School of Information Technologies, says the initiative has the support of schools as well as academics because it is beneficial for both high schools and universities. ‘If we can help high school teachers to fully engage their students in computer science and computational thinking, ultimately we will have students with higher skill levels enrolling at the University.’

As workshop participant and science teacher at St George Girls High School Jenny Zhang admits: ‘Technology is changing so rapidly, and students know about the technology — the latest, the greatest — but don’t know how to really use it or how it was developed. They really need help with it. Unfortunately, some of us are not as up to date or as computer-savvy as our students, and are working with knowledge from 20 years ago. This workshop is a perfect opportunity to build our knowledge with the assistance of Google and University of Sydney experts.’

Google spokesperson Sally-Ann Williams says the CS4HS program has already been successfully implemented in the US and parts of Europe. ‘We are delighted to have been able to make this program available in Australia and New Zealand,’ she says. ‘We look forward to partnering with more universities to equip and inspire more students across both countries.’

ENGINEERING WITH A CONSCIENCE

First-year engineering students across the country are currently embarking on the Engineers Without Borders (EWB) Challenge.

The challenge provides students with a unique opportunity to tackle a real-life problem during their first year of study, with the real possibility of their solutions actually being implemented in the field. Its aim is to inspire students to consider engineering in its global context.

This year’s challenge is to propose engineering services to assist the people of the Anh Minh district in the Mekong Delta region of Vietnam. Students will provide recommendations to facilitate development in essential services such as water, sanitation and hygiene, waste management and energy.

Previous participants have generated a range of innovative ideas, from vermicomposting organic waste to developing bicycle networks for sustainable transport.

The 2011 EWB Challenge was won by University of Sydney students Joe Karren, Durlabh Pande, Ash Wu and Chameka Madurawe. The team designed the self-sufficient Sustaina-Loo, a sanitation system that uses rainwater for toilet flushing and showering, solar energy for hot water, and waste for biogas production.
CAREERS FAIR 2012

The eighth Engineering Sydney Careers Fair was held in March at the Seymour Centre. More than 60 organisations attended the event, the highest industry participation rate since the onset of the global financial crisis in 2008. Approximately 2500 students also visited, the highest student attendance since the fair began in 2005.

Participating organisations primarily represented the private sector, as well as the research sector and federal and state government departments. They commented on the high academic quality of our students, and the professional way in which they presented themselves.

For more information and the full list of participating organisations, visit: sydney.edu.au/engineering/engineeringsydney/careersfair

CIVIL ENGINEERING FOUNDATION PRESENTATION ON HIGH-SPEED RAIL

More than 130 people attended an absorbing lecture on high-speed rail, delivered in May by Professor Andrew McNaughton from the UK.

The lecture was hosted by the Civil Engineering Foundation as part of its program to provide opportunities for exchange of local and international expertise and discussion on topical issues.

Professor McNaughton is Chairman of the European Rail Research Advisory Council and Vice-Chairman of the European Union Transport Advisory Group, as well as Chief Engineer of High Speed Two in the UK. He provided an overview of the development of high-speed rail in Britain and the challenges in its implementation, with particular reference to High Speed Two, which has recently been approved by government to proceed to construction.

Professor McNaughton discussed the capability of high-speed rail to bring communities closer together, and compared the different approaches to this issue throughout Europe and Asia. He concluded by emphasising that there is no shortcut to the successful implementation of high-speed rail; rather, it is ‘the work of generations’.
SAVE THE DATE:

THE WARREN CENTRE
INNOVATION LECTURE 2012

THURSDAY 6 SEPTEMBER
5.45PM
POWERHOUSE MUSEUM

RIC TAMBA, SENIOR VICE-PRESIDENT, PASSENGER CAR TRANSMISSIONS GLOBAL AT AVL

The Warren Centre for Advanced Engineering’s annual Innovation Lecture showcases Australian innovation and provides new perspectives on facing challenges and developing ideas.

The Innovation Lecture and associated Innovation Hero Awards place successful Australian innovators in the public spotlight, presenting innovation across such diverse fields as robotics, world-leading construction engineering, medical technology, electronic commerce and web-based media such as search engines and mapping technology.

Ric Tamba is an inspiring Australian innovator. With his team at NTC Powertrain he took the dual-clutch technology pioneered by Porsche in racing and applied it to everyday passenger cars, in one of the most significant industry-changing innovations in the driving world. His 2012 lecture will feature a showcase of automotive innovations, including everything from mechanical technology to embedded systems and intelligent transport.

The lecture will be presented in Sydney as well as in other states.

For more information, visit thewarrencentre.com.au

DEAN’S INTERNATIONAL LECTURE 2012

MONDAY 8 OCTOBER
6.30PM
THE SEYMOUR CENTRE

SIR DAVID HIGGINS, CHIEF EXECUTIVE, NETWORK RAIL UK

The Dean’s International Lecture Series brings key international guest speakers in the fields of engineering and information technologies to the University of Sydney.

This year’s guest speaker is Sir David Higgins, Chief Executive of Network Rail UK. Sir David was the faculty Alumnus of the Year in 2011. He was previously Chief Executive of the Olympic Delivery Authority (ODA) and held this role from March 2006 until January 2011. Prior to this, he was the Chief Executive Designate at the ODA from December 2005. Prior to December 2005, he was the Chief Executive of English Partnerships for three years. His early career was at Lend Lease Group, where he was appointed Managing Director and Group Chief Executive in 1995.

Free event but registration is essential. Registrations will open in August 2012 on sydney.edu.au/events

RESEARCH CONVERSAZIONE 2012

FRIDAY 2 NOVEMBER
12PM
THE SEYMOUR CENTRE

Now in its 24th year, the annual Engineering Sydney Research Conversazione is the faculty’s premier research event. The event showcases high-calibre research by undergraduate and postgraduate students, with a focus on innovative, applied research that responds to national and international needs as well as engaging with various new approaches and applications.

Academics, alumni and industry guests are invited to judge the winning posters and be present at the prize-giving ceremonies. If you wish to attend this major event, please contact:

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COMING EVENTS

TUESDAY 17 JULY
SYDNEY IDEAS LECTURE
By Jaan Tallinn, one of the programmers behind the Kazaa file sharing platform, and a founding engineer of Skype

TUESDAY 24 JULY
SYDNEY IDEAS LECTURE
By Professor Sir Christopher Bayly, University of Cambridge on The British Empire between reform and repression

THURSDAY 26 JULY
SYDNEY IDEAS LECTURE
By Tom Murphy, former Mayor of Pittsburgh and Ed Blakely, Professor in Urban Policy US Studies Centre and disaster recovery expert on City Revitalisation and Urban Renewal in the US

THURSDAY 30 AUGUST
COMEDY DEBATE – ALUMNI VS STUDENTS
Alumni team battle it out with top student debaters. Moderated by comedian Julie McCrossin (BA ‘89) and alumni team starring Adam Spencer (BA ’92), Dr Michael Spence (BA ’85), Vice-Chancellor and Principal and Julia Fetherston (DipEd ‘88 BA ’67).

THURSDAY 6 SEPTEMBER
THE WARREN CENTRE INNOVATION LECTURE 2012
Details: see page 11

MONDAY 8 OCTOBER
THE DEAN’S INTERNATIONAL LECTURE
By Sir David Higgins, Chief Executive, Network Rail UK
Details: see page 11

FRIDAY 12 OCTOBER
SCHOOL OF AEROSPACE, MECHANICAL & MECHATRONIC ENGINEERING (AMME) ANNUAL REUNION DINNER
A reunion for all AMME graduates whose final year of study ended in the number ‘2’ or ‘7’

FRIDAY 2 NOVEMBER
RESEARCH CONVERSAZIONE
Details: see page 11

THURSDAY 8 NOVEMBER
SYDNEY CONNECTIONS BREAKFAST
With Matt Barrie, CEO, Freelancer.com on The Next Big Thing

For more information and a full list of events, visit sydney.edu.au/events

STAY IN TOUCH

To ensure that you receive the latest information about your alumni program, including invitations to networking events and reunions, and the monthly alumni e-news, please update your contact details including your email address.

Visit sydney.edu.au/engineering/alumni to update your details.

The next Engineering Sydney newsletter will be published in March 2013.

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