Doctor of Philosophy (Built Environment, Engineering) (IF49)

Year offered: 2010
Admissions: Yes
CRICOS code: 006367J
Course duration (full-time): 2 years (max. 4 years)
Course duration (part-time): 4 years (max. 8 years)
Domestic fees (indicative): Aust citizens or PRs will be awarded an RTS/RTA place or a QUT sponsorship for tuition fees. If you exceed the max time, you will be charged - 2010: $11,750 per semester (indicative)
International Fees (indicative): 2010: $11,750 (indicative) per semester
Domestic Entry: At any time
International Entry: At any time
Campus: Gardens Point

Entry Requirements
First class or second class division A honours degree, an appropriate Masters Degree (research or coursework), or a professional doctorate, from a recognised institution. Masters degree by coursework and professional doctorates must contain a significant research component, of no less than 33 per cent of the total degree, and must have a GPA of at least 5.5 on a 7 point scale.

Overview
This program provides in-depth research training in particular areas of built environment and engineering while broadening knowledge in a chosen discipline area. In the multimodal program candidates conduct research away from QUT, often in the workplace, either in Australia or overseas. Videoconferencing, email and other technologies make it possible for candidates to participate in activities such as seminar delivery and progress reporting.

Candidates would normally undertake their Confirmation of Candidature and Final Seminar in person. A QUT staff member of the supervisory team would normally visit the candidate at their research site at least once during their candidature. External candidates must normally spend a minimum of three months at QUT and be present in person for their confirmation of Candidature and Final Semester. Doctoral studies normally include:
* assessed coursework
* participation in university scholarly activities such as research seminars, teaching and publication
* regular meetings with supervisors
* a program of supervised research and investigation
* preparation of a thesis. Candidates can enrol in a doctoral program through the Faculty Research Centre.

Fees
Australian citizens and permanent residents will be awarded a Research Training Scheme (RTS) place. Domestic students are not required to apply for an RTS entitlement, as it will be automatically allocated. The RTS covers tuition fees but not Guild fees or other study related costs. PhD Students are entitled to four years full-time equivalent study under these schemes. Students who exceed this entitlement may apply to QUT for extension, however the University may charge fees for the period of the program, which exceeds the student’s entitlement. The University determines the fee level.

Research Areas
Areas of research interest
You can enrol in a research program in the following thematic areas of research:
* Infrastructure (Energy, Water, Housing and Construction)
* Smart Systems (Speech and signal processing, robotics and automation, and infrastructure and asset management)
* Medical Engineering (Orthopaedics & trauma, Biomedical modelling and simulation) and
* Design (industrial design, interior design, urban design and architecture).

DESIGN
The DESIGN theme includes research in Architecture, Industrial Design, Interior Design, Landscape Architecture and Urban Design. It focuses on Subtropical Design, Digital Design, Human-centred Design Research and Useability, Built Environment Design Areas, Cultural Landscape, Design for Aging, Design and Research Methodologies and Design Education. The theme is cross/inter - disciplinary related with relevant fields in the Faculty (eg. mechanical/manufacturing/medical engineering; transport engineering; structures and designs; electronic systems and informatics environment) and across the University community (eg. Institute for Health and Biomedical Innovation (IHBI), Institute for Creative Innovation (ICI), Information Security Institute (ISI), Institute for Sustainable Systems and Resources and relevant Collaborative Research Centres (CRC).

MEDICAL ENGINEERING
This program aims to engender sustainable improvements in quality of life for everybody through the innovative
application of new and emerging technologies which will not only help reduce the economic burden of healthcare provision, but also generate wealth for the nation through the stimulation of local industry. Under two broad headings, the program encompasses the following research areas:

* Orthopaedic and Trauma

The Orthopaedic and Trauma group has seven principal areas of focus: bone defects; fracture healing; pathogenesis and repair of osteoarthritis; biomaterials; new approaches to minimally invasive surgery; paediatric and adult spine research; and clinical outcomes.

* Biomechanics, Modelling and Simulation

Apart from orthopaedic research, the Medical Engineering program also encompasses many other areas studying the application of mechanical and electrical engineering to clinically related healthcare problems. These include: amputee gait analysis; paediatric gait analysis; performance of paralympic athletes; osseointegrated implants; spinal and pelvic mechanics; paediatric spine deformity; artificial organs, specifically ventricular assist devices (artificial heart) and artificial lungs; tissue mechanics; bioelectrical signal analysis; tribology of artificial joints; and the interface between devices and the human body.

MEDICAL ENGINEERING - Biomechanical Modelling and Simulation

SMART SYSTEMS - Infrastructure and Asset Management

Infrastructure research, in collaboration with industry, government and professions, aims to strengthen the nation’s building and infrastructure systems. Research concentrates on investigating the performance of existing and new building and infrastructure systems under realistic structural and environmental loadings including those due to natural, accidental and man-made hazards. It uses smart materials, systems and technologies, and advanced computer analysis and test methods to assess and improve the performance of existing and new building and infrastructure systems.

Asset Management research focuses on innovative industry directed research and development, education and commercialisation in an integrated approach to lifecycle physical asset management to meet present and future needs to ensure international competitiveness and sustainability of Australian industry. The overall research program will be focused on five main industry sectors: Defence, Water and Waste, Power Generation and Distribution, Extraction and Process and Transport Infrastructure.

This research is closely aligned to the CRC for Construction Innovation and the CRC for Integrated Engineering Asset Management.

SMART SYSTEMS - Robotics and Automation

The Robotics and Automation program is focussed on world-class research on robotics and navigation systems for unmanned aerial vehicles, and involves collaboration with CSIRO and Boeing. However similar automation strategies and technologies are used in a variety of control applications such as energy network control, and infomechatronic systems, and satellites.

SMART SYSTEMS - Speech and Signal Processing

This program conducts internationally competitive research in order to solve practical problems, which enable Speech, and Signal Processing to be applied in products and processes. Research focuses on, state-of-the-art speech audio and video technologies including speech/speaker recognition and personal identification technologies for forensic and security applications; speech coding for storage and communication; speech synthesis for voice response systems; audio compression for broadcasting, television and Internet applications, video compression and image recognition and restoration.

INFRASTRUCTURE - Energy

The provision of sustainable energy supplies is of critical importance to the future of Australia, and this research involves experimental and theoretical research on solar cells, wind energy and solar thermal energy generation as well as fundamental research on energy supply networks, including distributed generation technology and energy policy. This research in conducted in collaboration with energy utilities and the Queensland Sustainable Energy Industry Development Group.

INFRASTRUCTURE - Water

The supply of fresh water and the quality of water supply are key issues facing Australia over the next 20 years, and this research looks at water re-use technology and policy. The research is practically focussed with significant collaboration with local government in South-East Queensland.

INFRASTRUCTURE - Transport

The aim of this program is to focus research effort in the freight and logistics area with an emphasis on multi-modal transportation systems. The main research areas include freight vehicle impacts, freight and logistics e-business systems, freight corridor evaluation analysis, ITS applications in freight and logistics, emissions modelling, transit evaluation methodologies, rail track modelling and analysis, and intermodal terminal planning and operations.

INFRASTRUCTURE - Housing and Construction

This research makes contributions to improved practice in the specific areas of housing, urban planning, international project management, construction and property
performance, construction information and procurement technologies, and property market choice, investments, constraints opportunities, internationalisation, taxation, lifecycles, risk and culture.

The Faculty is also involved in the following Cooperative Research Centres (CRC) and externally-funded collaborative research ventures:

CRC FOR CONSTRUCTION INNOVATION
The Centre aims to create and commercially exploit tools, technologies and management systems to deliver innovative constructed assets of financial, environmental and social benefit to the community. The centre combines basic research with strategic research and development in five related programs: virtual environments for lifecycle design and construction; construction project delivery strategies; environmental sustainability; integrated design and construction support systems; and management, adaptability and the future of built assets.

CRC FOR INTEGRATED ENGINEERING ASSET MANAGEMENT
The CRC for Integrated Engineering Asset Management (CIEAM) delivers capabilities and technologies for integrated and sustainable asset management to a wide range of Australian industries in both the private and the public sectors. CIEAM consists of leading edge researchers and practitioners focused on industry directed R&D and education in the management of Australia's major engineering assets in the Defence, Utilities (power, water and gas), Process and extraction, and Transportation industries. CIEAM involves five research program areas. These are: Models and decision systems, Advanced sensors, Intelligent diagnostics and life prediction, Systems integration and IT, and Strategic human dimensions.

CRC FOR RAILWAY ENGINEERING AND TECHNOLOGIES
The Centre aims through research to develop an internationally competitive, efficient and sustainable rail industry and to facilitate the development of an Australian export industry in railway technologies. Benefits will flow in terms of improved rail efficiency and infrastructure capacity, energy savings, reduced maintenance cost and better asset utilisation. The main research areas include: 'Smart train' intelligent systems; innovative/automated maintenance and upgrading technologies; optimal traffic control and scheduling; IT systems and standards for rail management; new materials, systems and components for railways; and, industry skills development (education and training).

CRC FOR ADVANCED AUTOMOTIVE TECHNOLOGY
The CRC for Advanced Automotive Technology brings the automotive industry together with researchers in design, engineering and manufacturing to enhance the industry's international competitiveness. The aim of the research is to reduce the concept-to-product cycle times, improved manufacturing flexibility and efficiency and the development of new material systems to meet the challenges of weight reduction, increased safety and greater functionality. The CRC will also improve vehicle safety through improvements in the crash worthiness of vehicles and new intelligent products/systems that provide increased comfort, performance and entertainment.

AUSTRALIAN HOUSING AND URBAN INSTITUTE (AHURI):
The Institute is a consortium of CSIRO Division of Building, Construction and Engineering; Queensland University of Technology; University of Queensland; Monash University, and Royal Melbourne Institute of Technology (RMIT). Its broad objective is to conduct research into issues in housing and urban fields in Australia and the Asia-Pacific region.

CENTRE FOR SUBTROPICAL DESIGN
The Centre for Subtropical Design is one of the Faculty's first funded units in one of our major targeted areas: sustainable development. This Centre will promote high quality planning, design and development that responds to the City of Brisbane and South-East Queensland Region's cultural, landscape, and climatic characteristics in ways that are sustainable and enhance the enjoyment of the region's subtropical lifestyle.

QUEENSLAND SUSTAINABLE ENERGY INDUSTRY DEVELOPMENT GROUP
This group, formed in 2004 by QUT, the University of Queensland, Central Queensland University, Stanwell Corporation, CS Energy and the Queensland Conservation Council, is continuing the work of the Australian CRC for Renewable Energy in areas of energy policy, training for the sustainable energy industry (supply and use), and renewable energy technology.

AUSTRALIAN CENTRE FOR SUGAR RESEARCH
This Centre is the research division of the former Sugar Research Institute which transferred to QUT in July 2005. This Centre conducts research into the post-harvest processing and economics of sugar cane, and has a particular expertise in milling technology (mechanical engineering and computational fluid dynamics modelling), separation science, and total biomass utilisation, in particular the transformation of sugar cane waste into biofuels (ethanol) and biopolymers to provide renewable fuels and industrial chemicals.
International Student Entry
QUT advises that International Students may only enrol in full-time studies.

Further Information
The Centre for Built Environment and Engineering Research
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