



SCHOOL OF PLANNING, ARCHITECTURE AND CIVIL ENGINEERING

INFORMATION PACK

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INTRODUCTION

The School of Planning, Architecture and Civil Engineering at Queen's University Belfast brings together the former Schools of Civil Engineering, Architecture and Environmental Planning under a new academic structure for the University.

This new structure is designed to provide a framework within which the development of a world-class research and education portfolio can be developed to make Queen's competitive at national and international levels.

Civil Engineering

Civil Engineering education in the QUB started in 1845 when Queen's College was founded and currently the School of Planning, Architecture and Civil Engineering provides a higher education for those who primarily wish to train as professional Civil Engineers within the construction industry. It was rated as No. 3 for three consecutive years since 2003 in national league tables for high quality teaching and research in Civil Engineering. The School has strong links with the professional bodies, including the Institution of Civil Engineers, the Institution of Structural Engineers, and the Institution of Highways and Transportation Engineers. Many of the academic staff are chartered engineers who are practising within the academic sector as lecturers and researchers. Strong emphasis on 'buying in' and exchanging professional expertise with industry is embedded in the curriculum.

Architecture

Queen's University has offered degrees in architecture since 1965 when the Department of Architecture was founded within the Faculty of Applied Science and Technology.

Architectural education in the QUB School of Planning, Architecture and Civil Engineering has a longstanding tradition in advancing and teaching interdisciplinary design with emphasis on technology and culture. The Architecture curriculum recognises and addresses the increasing complexity of architectural education and practice given the needs of an ever-changing society. It also approaches topical issues by encouraging creativity, teamwork and critical thinking. In recognising architectural diversity and discourse, the curriculum relies on a number of study tours to leading European cities, and promotes international exchange programmes.

Planning

Planning in the QUB School of Planning, Architecture and Civil Engineering is one of the leading programmes in both the UK and Ireland for learning and teaching. The Queen's University prides itself in good student-staff relations and has strong links with the Planning profession throughout Ireland. QUB Planning obtained 22 out of 24 points in the Teaching Quality Assessment exercise and in the more recent University Subject Review, it was noted that Planning provides "an excellent learning environment for its students". The BSc course provides a strong multi-disciplinary training with an opportunity to specialise in further postgraduate study. Graduates have an excellent record in obtaining employment in recent years, being rated 10/10 in recent Guardian tables.

RESEARCH EXPERTISE

The newly formed School of Planning Architecture and Civil Engineering has three research clusters with close links; the Environmental Engineering Research Centre, the Centre for Built Environment Research, and the Institute of Spatial and Environmental Planning.

Environmental Engineering Research Centre

Director of Research - Dr. G. Hamill

The Environmental Engineering Research Centre (**EERC**) ethos allows scientists and engineers from all areas of environmental research to work well together and maximise the complimentary expertise of each academic and post-doctoral researcher. At present, the EERC is comprised of 18 academic staff, 7 post-doctoral researchers, 31 PhD students, 6 technical and 4 clerical staff. The research undertaken is diverse in application, from fundamental, to applied industrial interest, to the needs of developing countries. EERC uses the principles of science and engineering to minimise society's impact on the natural environment.

The diverse yet complimentary nature of scientific and engineering expertise contained within the EERC and the resulting overarching research is clearly one key to this research cluster's success.

Both scientific excellence and relevance to problems affecting today's society of the research undertaken by members of the EERC are clearly recognised by winning prestigious awards such as the Parsons Brinckerhoff's Project of the Year 2004 award in the "Studies and Special Projects" category for the SEREBAR Groundwater Treatment System, or by being one of the seven consortia to be awarded funding through EPSRC's 4th Think Crime Programme for a research project on Isotope Profiling (or Fingerprinting) of Drugs.

Research areas:

- Highways and Transportation
- Geotechnical Engineering
- Crime, Environmental Forensics & Human Health
- Geohydrology and Contaminated Land
- Water Treatment & Environmental Engineering
- Coastal Engineering and River Hydrology

Centre for Built Environment Research

Director of Research - Professor PAM Basheer

The Centre for Built Environment Research (**CBER**) is concerned with developments in infrastructure that support life in a more sustainable manner. It integrates activities of two research groups from the Schools of Civil Engineering and Architecture, which existed prior to September 2005, viz. the Structures and Materials Research Team (SMART) and the Architecture Technology and Design Group. SMART received the highest rating, equivalent of 5*, in the Research Assessment Exercise 2001. With huge quantities of natural resources and energy being used by the construction industry, supporting a sustainable society is highly dependent on the sustainability of the construction sector. In this context, close cooperation between architects and engineers cannot be overemphasised.

The Centre for Built Environment Research deals with cultural heritage, civil engineering infrastructure and testing and monitoring of the built environment, and provides an ideal setting for interdisciplinary research projects that directly benefit the society and its sustainability.

Research areas:

- Advanced Construction Materials and Technologies
- Durability of Structural Materials and Technologies
- In Situ Tests for Assessing Structures and Materials
- Intelligent Sensing
- Structural Behaviour and Composites
- Information and Communication Technologies in the Built Environment
- Environmentally Sustainable Urban Development
- Sustainable Materials and Building Technologies
- Cultural Heritage and Sustainability

Institute of Spatial and Environmental Planning

Director of Research - Dr. F. Gaffikin

The Institute of Spatial and Environmental Planning (**ISEP**) is one of the fastest growing and dynamic planning research environments in the United Kingdom. ISEP seeks to confront the challenges created by the uneven relationships within and between society and the built and natural environments.

The Institute's programme is based on the concept of spatial planning and whilst its empirical work is partly grounded in the region, it is built on strong international, interdisciplinary and theoretical references. Its particular strength is the staff team who have built a track record in scholarly and applied research and a wide ranging portfolio of publications, research grants and doctoral studentships.

The Institute values the connection between research and teaching programmes and the application of empirical work in a learning environment, and continues to innovate and develop teaching programmes to reflect a rapidly changing market place, problem and policy context and changes in professional standards.

The last six year have seen a rapid growth in the volume and quality of research in ISEP. The Institute works to a long term research strategy which has helped to deliver considerable investment in staff, studentships and infrastructure in spatial planning. ISEP research portfolio reflects the regionally distinctive planning environment but is intimately connected to global debates about the changing nature of space, policy and practice.

Research areas:

- Spatial Planning and Sustainability
- Spatial Planning and Rural Development
- Spatial Planning and Contested Spaces

UNDERGRADUATE COURSES OFFERED

Civil Engineering:

The aims of the courses are to provide students with a sound understanding of scientific and engineering principles and the ability to relate these to engineering practice. At the same time, students should develop creative abilities and enquiring minds which will serve as a good foundation in a challenging career. In accordance with the overall approach to teaching adopted in the University, the course is completely modular, allowing subjects to be studied and examined as discrete blocks. Graduates of the BEng course will require a further year of postgraduate study to become eligible for Chartered Engineer status under the SARTOR 3 rules.

MEng and BEng in Civil Engineering

Civil Engineering is a broad subject discipline which is concerned with the planning, design, construction, and operation of public services and private facilities. Examples range from roads, railways and airports to river and coastal works.

The extended four year course leads to the degree of Master of Engineering (MEng). The first three years are similar to the BEng course, with management skills, communication skills and specialist subject areas being more fully developed in the fourth year.

Master in Structural Engineering with Architecture

Structural Engineering with Architecture is concerned with the planning, design, construction, and maintenance of buildings. The course combines a sound structural engineering education with an understanding of architecture, town planning, building services, and construction management. The course is run in conjunction with Architecture and Environmental Planning. This arrangement provides an ideal opportunity to respond to demands from industry for graduates with a combination of these skills.

MEng in Environmental and Civil Engineering

Many Civil Engineering projects have a significant impact on the environment. This course has been developed to equip graduates with the wide range of knowledge and skills necessary to meet the demands of improving the environment.

Architecture:

The Undergraduate Honours BSc Degree (Part I), the subsequent year out, practical training, followed by the Bachelor of Architecture BArch (Part II), and the final year out culminating in the Professional Practice examination, lead towards registration as an Architect. This allows successful students, not only to practise as architects in the UK but also, through the Architect's Directive, within the EU. The course has profited greatly from increased input from visiting critics, lecturers and regular contributions from teaching assistants in practice, as well as from the regular work of full time staff. The high quality of design and teaching has been recognised in the judgement of the RIBA accreditation panel in 2003, which awarded a further four years of recognition.

Bachelor of Science in Architecture - BSc

The BSc is a three year full-time undergraduate course recognised as meeting Part I examination and membership requirements of the RIBA and ARB. It is also the first route to becoming a chartered architect. It offers a wide ranging general education in design, visual appreciation, and architectural technology.

Bachelor of Architecture - BArch

The BArch is a two year full-time postgraduate course recognised as meeting Part II examination and membership requirements of the RIBA and ARB. It is the second level towards becoming a chartered architect. The course helps students develop a broad set of skills in architecture, and offers a solid grounding in sustainable design, building technology and urban design.

Professional Practice and Practical Experience Certificate – Part III

The certificate course provides exemption from the RIBA Final Examination Part III and is recognised by the Architects' Registration Board for the UK for the purposes of registration under the Acts. Successful graduates are eligible for chartered membership of the Royal Institute of British Architects and registration with the Architects Registration Board.

Planning:

The course consists of two separate components. The primary three-year element (Stages 1-3) leads to the degree BSc in Environmental Planning. Students graduating with a 2ii Honours or better are then permitted to progress to a further year of specialised postgraduate study in Planning.

The overall aim is to provide both a general and specialist education for those wishing to work in the broad field of Town and Country Planning in the public, private or voluntary sectors. The 3 year BSc followed by a year of postgraduate study is accredited by the Royal Town and Planning Institute, so that after a short period of work experience, graduates may become Chartered Town Planners, necessary for some areas of Planning employment.

Although the programme has been devised primarily for students wishing to enter the Planning profession, care has also been taken to ensure that graduates of the primary BSc in Environmental Planning course are equipped with skills that will open up a wide range of job opportunities with government, local authorities, developers, and various sections of the building industry.

Bachelor of Environmental Planning - BSc

The BSc is a three year full-time undergraduate course recognised as meeting the requirements of the Royal Town and Planning Institute. It is also the first route to becoming a chartered Town Planner (RTPI). It focuses on design and the creation of places that are both sustainable and embody a high quality of life.

POSTGRADUATE DEGREES (TAUGHT)

Master of Science (MSc), PG Diploma and Certificates

The School offers a range of multi-disciplinary and uni-disciplinary postgraduate taught programmes, which have been developed to address the growing demand of the society to deal with issues in planning, design and execution in the area of Built Environment.

- Environmental Engineering
- Environmental Forensics
- Water Resources Management
- Durability of the Built Environment
- Integrated Sustainable Design
- Construction and Project Management
- Environmental Planning
- Urban and Rural Design
- Spatial Regeneration

The last three courses are recognised by the RTPI as conferring specialist planning qualification, giving graduates added advantage when applying for employment. Other courses will be subjected to professional body accreditation in the next available opportunity.

POSTGRADUATE DEGREES (RESEARCH)

The School offers advanced research degrees (MPhil and/or PhD) in a number of areas of interest to the current teaching staff in the three research centres. Projects offered would be in one of the following areas:

Environmental Engineering Research Centre

- Coastal Management
- Estuary Hydraulics
- Environmental Hydrogeology

Centre for Built Environmental Research

- Structural Modelling
- Concrete Durability
- Construction Materials
- Geotechnics
- Highway Engineering
- Sustainable design
- Housing studies
- Urban cultural heritage
- Construction management
- ICT in the Built Environment

Institute of Spatial and Environmental Planning

- Land use planning
- Liveability of city centres
- Spatial planning
- Conservation policy
- Regional development.

FACILITIES

The School's teaching and research facilities include a wide range of lecture rooms, design studios, and state-of-the-art computer and engineering laboratories. In addition the School has access to a number of very specialist items of equipment in the School of Physics (such as Electron Microscope, Transmission Microscope and Focussed Ion Microscope) and the computer modelling facilities in the Northern Ireland Technology Centre, through the close working relationship.

The School has also benefited from an inward investment of £100,000 by Queen's in early 1990s and this has enabled it to attract several EPSRC and Industry funded grants. The university has allocated funds for setting up a Materials Science Lab. and the purchase of different types of equipment which will enable the microstructural and the morphological studies of engineering materials. The summary of the facilities available to the School is given below:

- Walk-in environmental chamber, of size: 2.2x2.0x1.8 m, temperature range: 0 - 60 °C, and relative humidity range: 15 - 95%.
- Two programmable environmental cabinets of 1 cubic metre capacity, with capabilities to set temperature and humidity for a wide range of test combinations.
- Carbonation chamber of 600 cubic centimetre capacity, with microprocessor controlled relative humidity, temperature and carbon dioxide concentration ranges.
- Constant temperature and humidity research labs.
- Two drying cabinets with large storage space to work in the temperature range from 20 - 60 °C while maintaining a relative humidity of 20%.
- Test apparatus to measure porosity, permeability, ion diffusion, tensile strength, compressive strength, flexural strength, shear strength, moisture content and other physical properties of construction materials.
- Computer controlled instrumentation facilities to monitor corrosion of metals in concrete and internal moisture content and resistivity of construction materials.
- Fully equipped labs for the manufacture, curing, and conditioning test specimens, and their preparation, including coring, cutting and polishing, for carrying out tests.
- Facilities to carry out chemical and microstructural analyses of construction materials, which include UV/VIS spectrophotometer, high temperature differential scanning calorimeter, chemistry lab, and image analysis software. Also, the School has access to a scanning electron microscope, mercury intrusion porosimeter, X-ray diffraction and X-ray fluorescent spectrometers and gas chromatography.
- Computational facilities to model the transport of fluid through construction materials and to develop both expert systems and database management systems to deal with the durability of construction materials.

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Environmental Engineering Laboratories:

- Environmental tracers laboratory (80m²)
- Hydrogeology and isotope biochemistry laboratory (200m²)
- Water resources laboratory (100m²)
- Environmental forensics laboratory (80m²)
- Geotechnical laboratories (80m² and 50m²)
- Water and wastewater laboratory (50m²)

Structures and Materials Laboratories:

- Structural testing laboratory (250m²)
- Concrete preparation and curing laboratory (250m²)
- Material testing laboratory (130m²)

Manufacturing/Instrument support:

- Model and joinery workshops (300m²)
- Metal workshop (500m²)

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