



University of  
**Strathclyde**  
Glasgow

**faculty of engineering**

**POSTGRADUATE PROSPECTUS 2012**



# Why Strathclyde?

EVERY YEAR, hundreds of postgraduate students make Strathclyde their first choice. It's largely because of our international reputation for world-class research facilities and the excellence of our teaching staff. But it's also because Strathclyde is a friendly and forward-thinking university based in the heart of Glasgow, one of Europe's finest cities.

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# Scotland on your doorstep

For fans of the outdoors, the stunning Trossachs and Highlands are just a short drive or bus journey away from the University.

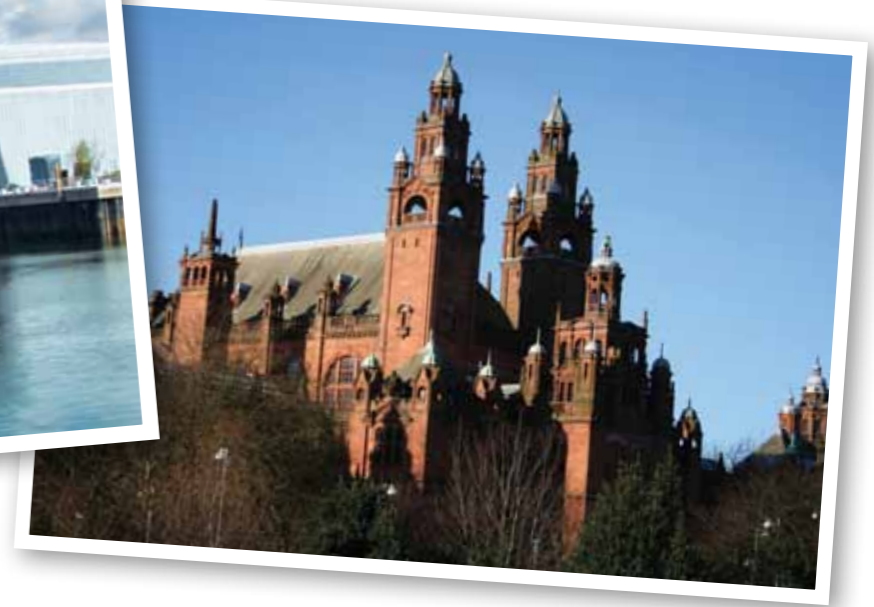
You can enjoy a wide variety of activities such as hillwalking, sailing and skiing. Or you could hop on a boat to one of Scotland's many islands and enjoy picturesque landscapes and fascinating wildlife.

In addition to rural sights, you can visit Edinburgh, which is just 40 miles east of Glasgow. From the sophisticated shops and bars of the New Town to the quirky cobbled streets of the medieval Old Town, the capital begs to be explored. Equally, history, culture and entertainment characterise Scotland's other towns and cities, including Inverness, Aberdeen and Stirling.





The Riverside Museum, Scotland's museum of transport and travel, is Glasgow's newest, most contemporary attraction.



# welcome to **Glasgow**

Scotland's largest city is well known for its friendliness and its sense of style. Elegant buildings, outstanding art collections, a flourishing music scene and fashionable bars, restaurants and shopping mean that you will never be at a loss for something to do and see.

Many of Scotland's arts organisations are based in Glasgow – the National Theatre of Scotland, Scottish Ballet, Scottish Opera and Royal Scottish National Orchestra, to name but a few. Glasgow is also home to the Mitchell Library, the largest public library in Europe, and Kelvingrove Art Gallery and Museum, Scotland's most popular visitor attraction.

Glasgow may buzz with life and activity, but it also provides plenty of opportunity to unwind. Did you know that 'Glasgow' means 'dear green place'? With more than 70 parks and green spaces, you can easily discover a haven away from the rush of modern urban life.

Flights of an advanced craft into 'near space' launched by engineering students via a helium balloon helped build flight heritage and knowledge to develop them into highly skilled professionals fit for the modern world.



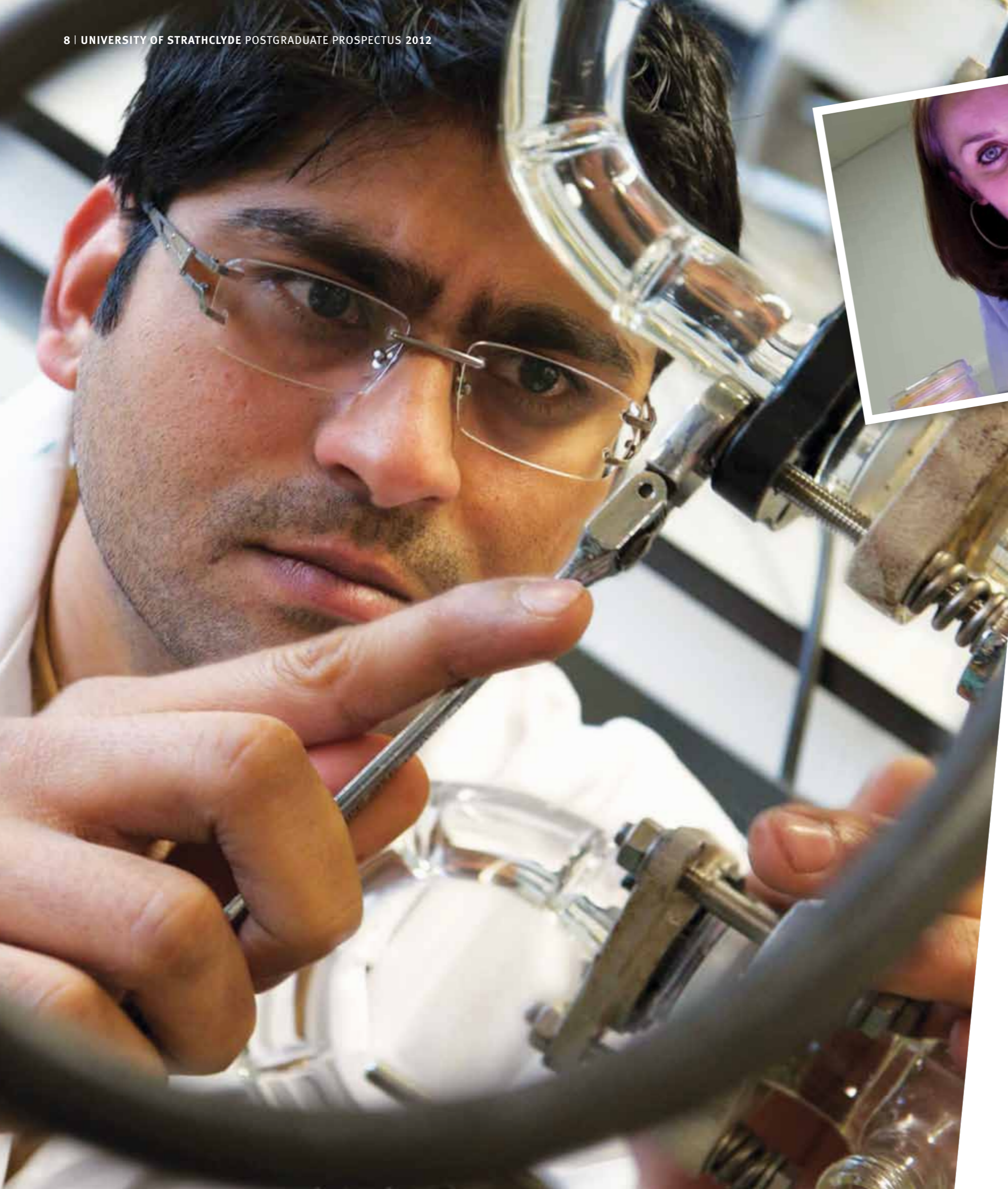
# our vision

More than two centuries ago, Professor John Anderson shared his vision for a 'place of useful learning' and in doing so laid the groundwork for the University of Strathclyde.

We remain committed to Anderson's vision to this day. Strathclyde is a technological university, a leader in finding solutions to the challenges facing society. We are international in outlook, but locally grounded: we believe that the University must play an essential role in society through education, research and the development of new technologies and policies.

The world-leading Technology and Innovation Centre at Strathclyde (TIC) will transform the way universities and industry collaborate to bring global competitive advantage to Scotland. TIC will bring together academics, researchers and project managers from the University and its leading industrial partners to work side-by-side in a state-of-the-art building in the heart of Glasgow. Opening in 2014, TIC reflects Strathclyde's commitment to finding solutions to challenges in sectors central to economic regeneration in Scotland and further afield.





# our research

Our research underpins our education and knowledge exchange to make a significant impact on today's world.

Our research power and its continuing growth in areas of strategic importance – engineering, science, business and social sciences – were confirmed by the most recent Research Assessment Exercise. The Strathclyde Business School was rated top in Scotland by a wide margin and in the UK top 10; we achieved the highest 'research power' rating for engineering in Scotland; and our performance was impressive in areas from across the sciences and social sciences.

Find out more on our website at [www.strath.ac.uk/research](http://www.strath.ac.uk/research)



# your experience at Strathclyde

The University of Strathclyde has been established in the heart of Glasgow for over 210 years.

In choosing Strathclyde, you join a vibrant community of over 15,000 students from more than 100 countries, attracted by our academic reputation and stimulating environment.

Our students' Strathclyde experience is at the heart of what we do. During your time here, you will benefit from a range of support services, whatever your field of study and whatever type of degree you choose. We offer mentoring and support for early career researchers, training events and careers assistance for all students and targeted support and English language instruction for overseas students.

You will enjoy life on campus and in Glasgow, thanks to the many clubs and activities available at the University and to the restaurants, shopping and nightlife available on your doorstep in the city centre.





[www.strath.ac.uk/engineering](http://www.strath.ac.uk/engineering)



# faculty of **engineering**

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**482**

Postgraduate students (research)

**709**

Postgraduate students (taught)

**179**

Academic (teaching) staff

**167**

Research staff

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Internationally renowned for our high quality teaching, innovative research and extensive links with industry, you can be sure that Strathclyde is the ideal place to support and develop your engineering career.

## FACULTY OF ENGINEERING

The Graduate Schools within the Faculty of Engineering provide high quality advanced engineering training with an unrivalled portfolio of innovative, industrially-focused postgraduate taught courses and leading research programmes.

As a student in the Faculty of Engineering, you will be part of a supportive international community working with academic experts in some of the very best facilities. Our programmes are designed to equip you with the skills that are sought-after by employers such as team-working, communication and presentation skills.

Similarly, through industrial lectures and careers seminars, you will have opportunities to network with our extensive industrial contacts, giving you invaluable access to potential employers.

You will enjoy access to personal development opportunities and management training workshops, enabling you to meet and work with other students across the range of engineering disciplines.

### ENGINEERING RESEARCH EXCELLENCE

From heart surgery devices to powering the world with more efficient renewable energies and greener transport, Strathclyde engineering researchers are at the forefront of solving some of the major problems facing today's society.

As a researcher in the Faculty, you will be able to participate in some of the leading international research in engineering supported by a research portfolio of over £85 million with contributions from research councils, government and industry. Multimillion pound investments in specialist research labs and study suites mean that our students have access to the very best facilities.

We are committed to helping the personal development of our research students. Induction days and writing and presentation skills training allow you to meet researchers from across the Faculty and the University. Our annual Research Presentation Day, with its poster and oral presentation sessions, is an established event which allows

you to showcase your work to colleagues and industrialists. You will also benefit from the continuous support of two supervisors to help you publish your first paper and provide opportunities to attend and present at international conferences.

The most recent Research Assessment Exercise (RAE 2008) confirmed Strathclyde as achieving the highest engineering 'research power' measure in Scotland and in the top 10 within the UK. Four major interdisciplinary themes bring together academic expertise across departments:

- > **Advanced Materials and Manufacture:** including materials science, forming, nano-materials, advanced energy materials and computational engineering
- > **Aerospace and Marine Technologies:** including new technologies and materials, behaviour analysis and prediction, multi-criteria optimisation, aerospace engineering incorporating space systems, low emission aircraft and future hypersonic vehicles, hydrodynamics, safety analysis, and structural analysis
- > **Energy, Sustainability and the Environment:** including renewable power generation and distribution, renewable energy (low carbon) technologies, power electronics, drives and energy conversion, advanced electrical systems and power systems, integrated sustainable built environment and systems design, building integrated energy systems, earth and environmental science and engineering, geophysics and geotechnical engineering, water engineering, sustainable structural engineering and pollution control and environmental assessment
- > **Health Engineering:** including medical devices and diagnostics, cell and tissue engineering, rehabilitation engineering, bio-molecular engineering, neurodegenerative diseases, safety engineering, photonics and micro systems and environmental health

These integrated themes are underpinned by additional core competencies in areas such as telecommunication technologies, control systems, signal and image processing, non-destructive testing and enabling engineering.

Please contact the Faculty for details.

### RESEARCH DEGREES

MPhil, MRes, PhD, EngD

### CONTACT

Faculty Office (Engineering)

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## FACT FILE: INDUSTRY-UNIVERSITY COLLABORATION



The Advanced Forming Research Centre (AFRC) is a partnership comprising Strathclyde's Departments of Design, Manufacture and Engineering Management, and Mechanical Engineering, and global industrial manufacturing companies. Current industrial members range from multinationals such as Rolls-Royce, Boeing, Mettis Aerospace, Timet and Aubert and Duval, to specialist suppliers such as GKN, Bodycote, EKES and Fanuc. The AFRC's activities range from blue-sky projects which will lay the foundations of future forming technology to trouble-shooting of established industrial processes.

The new £16M purpose-built facility for the Centre, located near Glasgow International airport and now fully operational, reflects the status of this internationally significant research centre. The wide range of members and supporting industry enables the AFRC to engage effectively with multi-scale problems in which researchers need to relate macro process parameters (such as tool geometry and loading rates) with micro-characteristics of the form material (such as grain size and structure).

## Master's by Research in Engineering

### MRes

This course is suitable for those who wish to develop research skills in a particular engineering domain of study, are curious about the nature and challenges of research, or who wish to undertake a fundamental or applied research-based Masters degree.

The course will equip participants with the skills to carry out an in-depth research investigation and prepare, analyse, document and communicate their findings.

### Course Structure

Students study 80 credits of taught modules and undertake a 120-credit supervised research project on a topic selected in consultation with course leaders. Of the 80 taught credits, students are required to undertake an approved curriculum which comprises:

- > compulsory modules (20 credits)
- > research training module (10 credits)
- > module chosen from a list reflecting good research practice, such as engineering project or risk management (10 credits)
- > classes from within the Faculty of Engineering relevant to the chosen discipline (40 credits)

An individual research project (120 credits), either theoretical and/or application oriented, may be work-based or allied to one of the many areas of research strengths within the Faculty.

Applicants should include a personal statement detailing the engineering sector they are most interested in and an indication of the area of research they wish to pursue.

### Compulsory Modules

- > Research Protocols for Science and Engineering
- > Engineering Risk Management or Project Management

### Course Duration

12 months full-time; 24 months part-time

### Entry Requirements

First- or second-class Honours degree from a UK university (or equivalent overseas qualification). The course is principally aimed at graduates from an engineering or physical science discipline. However it is also suitable for employees of public and private sector companies who wish to upgrade their skills.

### Funding

Funded studentships may be available. Please contact the Faculty Office for information.

### Careers

This course offers graduate engineers the opportunity to upgrade their research skills within any engineering domain. On successful completion of the programme it may be possible for good quality researchers to progress to higher research degrees such as the Engineering Doctorate (EngD) or Doctor of Philosophy (PhD). Alternatively, graduates could work in leading organisations and consultancies developing state-of-the-art products, systems and services.

### Contact

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# Postgraduate Training Programme in Sustainable Engineering

[www.strath.ac.uk/engineering/sustainableengineering](http://www.strath.ac.uk/engineering/sustainableengineering)

## MSc/PgDip/PgCert

This flexible, multidisciplinary programme combines study in specialist, advanced engineering technologies underpinned with training in sustainability. Sustainable engineering involves the responsible use of energy and resources at a rate and in a manner which does not compromise the environment, or the ability of future generations to meet their own needs. Examples include improved and more effective renewable energy sources, reduced energy loss in buildings, new energy-efficient production processes, improved product life-cycle assessment procedures, and more effective transportation systems and urban planning instruments.

The course examines such concepts through specialist and generic taught modules and industry-relevant projects. With input from industry and a range of Engineering departments, the course is a cross-disciplinary collaboration relevant to students seeking careers in industry and to industry staff seeking to further their professional development.

## PROGRAMME STRUCTURE

### Step One: Select Your Specialist Theme

- > Building Design & Management
- > Chemical Processing
- > Marine Technology
- > Offshore Renewable Energy
- > Renewable Systems and the Environment
- > Sustainable Product Development

### Step Two: Select Two Generic Modules

- > Design Management
- > Financial Engineering
- > Information Management
- > Project Management
- > Risk Management

### Step Three: Select at least One Environmental Module

- > Environmental Business Strategy
- > Environmental Impact Assessment
- > Environmental Management Systems

### Step Four: Complete Your Group Project

### Step Five: Complete Your Individual Project

## Teaching Structure

Sept-Dec	Jan-April	April-Sept
<ul style="list-style-type: none"> <li>&gt; Specialist Modules</li> <li>&gt; Generic Modules</li> <li>&gt; Field Trips/Workshops</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Group Project</li> <li>&gt; Sustainable Engineering Annual Conference</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Individual Project</li> </ul>

## SPECIALIST THEMES

The programme has been developed with industrial input to provide you with a solid understanding of modern, sustainable engineering. You can achieve an MSc, PgDip or PgCert in one of the specialist themes listed below and described on the following pages.

### Course Structure

The course consists of at least three related components: instructional modules; group project; and individual project.

### GENERIC MODULES

You will take at least three generic modules which meet employers' requirements for comprehensive engineering skills and satisfy key requirements to attain Chartered Engineer status.

### SPECIALIST MODULES

You also take a number of modules (three for the Postgraduate Certificate award, up to five for the Postgraduate Diploma/MSc) relevant to your selected specialist theme.

Successful completion of six instructional modules leads to the award of a Postgraduate Certificate.

### GROUP PROJECT WORK

The second semester allows you to apply your learning by working within a group of students from different specialist themes to produce sustainable solutions for real-life industry problems. Site visits, field trips and regular progress reports to industrial partners are an integral part of the process and you will develop valued skills in team-working, problem-solving, report-writing and presentation.

Successful completion of eight instructional modules and a group project leads to the award of a Postgraduate Diploma.

### INDIVIDUAL PROJECT ASSIGNMENT

MSc students undertake an individual project which allows you to study a selected topic in depth and submit a thesis. There is also substantial industry input at this stage in the form of project ideas that bring engineering graduates and business representatives together.

Successful completion of eight instructional modules, a group project and an individual project leads to the award of an MSc.

### Course Duration

MSc: 12 months full-time; 24 months part-time (minimum)

PgCert/PgDip: 9 months full-time; 18 months part-time

### Entry Requirements

First degree or other qualification equivalent to an Honours degree in a relevant engineering, technology or science discipline.

Entry may be possible with other qualifications provided there is evidence of relevant experience and of the capacity for postgraduate study.

A limited number of competitive Engineering and Physical Sciences Research Council studentships are available to UK and EU students.

### Careers

Sustainability is increasingly important as business and industry acknowledge the need to account for the social and environmental impact of their activities. Employers place a high value on job

candidates whose expertise in their chosen field is underpinned by a comprehensive understanding of sustainable approaches and practices.

This programme facilitates access to and networking with industry representatives from across the spectrum of small- and medium-sized businesses to large corporations. Graduates have gone on to work for ScottishPower, Shell, ExxonMobil, BAE Systems and Accenture, among many others.

### CONTACT

Engineering Faculty Office

t: +44 (0)141 548 2749

e: sustainable-engineering@strath.ac.uk

## SPECIALIST THEMES

### BUILDING DESIGN & MANAGEMENT

Buildings designed and managed for sustainability should meet our current architectural needs without compromising the ability of future generations to meet their own needs. In so doing they require to employ energy and resource efficiencies to lessen their impact while striving for an improved economic, social and environmental performance.

This course provides you with advanced knowledge of social, environmental and economic sustainability, an understanding of current design, construction project management and practice methods, energy resources and policy issues, and through project work or a dissertation will examine how these can be applied in the practice of sustainability.

The programme is aimed at early to mid-career building design-related professionals who are seeking a competitive edge in the workplace and the opportunity to bring strategic sustainable design and management thinking into their own modes of practice. We aim to produce 'sustainable design champions' who will be industry leaders. The course is open to both full-time and part-time students wishing to take up careers within the building industry. Much of the course resource material will be delivered using web-based learning techniques.

### Curriculum

You undertake an integrated programme of both generic and specialist taught modules along with industry-relevant projects. The generic modules are detailed on preceding page; the specialist modules in Building Design and Management are:

- > Ecology, Sustainability and the Built Environment
- > Construction Project Management
- > Energy Resources and Policy

### Contact

Postgraduate Secretary

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e: e.thomson@strath.ac.uk

### CHEMICAL PROCESSING

This course is open to full-time students wishing to take up careers in industry or continue with a career in chemical engineering research. It is particularly relevant to those interested in studying chemical engineering within a framework of sustainable practice.

Our chemical engineering specialists are at the forefront of emerging technologies such as alternative fuels and nanomaterials for use in advanced chemical reactors and separation processes. Chemical engineering at Strathclyde receives consistently high student satisfaction ratings for teaching quality and the Department is among the best in the UK. Staff are experienced in key areas such as environmental protection, process design, safety and

advanced chemical processes. In addition to modules in advanced chemical engineering topics, we offer the opportunity to work with our team of leading researchers on chemical engineering issues of the future.

### Curriculum

You undertake an integrated programme of both generic and specialist taught modules along with industry-relevant projects. The generic modules are detailed on the preceding page; the specialist modules for Chemical Processing may include:

- > Colloid Engineering
- > Safety Management Practices
- > Process Design Principles
- > Emerging Technologies
- > Energy Systems
- > Programming & Optimisation
- > Environmental Control Technologies

### CONTACT

Brian Dickson

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e: brian.dickson@strath.ac.uk



### KASHIF MOGHUL

#### Sustainable Engineering Programme (Chemical Processing)

Having completed my undergraduate degree at Strathclyde I wanted to continue my studies here due to the helpful and friendly attitude of the Chemical Engineering Department. In addition Strathclyde is an excellent university for engineering with good links with industry.

This MSc course has helped me gain experience and confidence through working together with people from different disciplines on various projects. Experience in industry was one of the most valuable parts of the course, along with the fact that you can choose subjects to develop your career. I've attended a range of events hosted by the Chemistry Society and have found that this is a great way to network and meet new friends.

## MARINE TECHNOLOGY

The structure of this course allows you to specialise in any one of the wide range of subject areas within the diverse discipline of Marine Technology. The course is designed for experienced or newly-qualified engineers in Naval Architecture, Marine Engineering, Mechanical Engineering, Civil Engineering or other related disciplines.

This course will prepare you for a wide range of challenging and rewarding positions in the marine and related industries, including design and construction of all types of marine vehicles; project management; systems design; safety management; support services; classification societies and consultancy services.

Facilities available include a small hydrodynamics laboratory, custom-built research areas, and a major hydrodynamics laboratory facility and racing yacht offsite. The University is unrivalled in Europe for its teaching and research expertise in naval architecture and related disciplines.

### Curriculum

You undertake an integrated programme of both generic and specialist taught modules along with industry-relevant projects. The generic modules are detailed on pg 16; the specialist modules in Marine Technology are:

- > Risers and Mooring Lines
- > Advanced Marine Structures
- > Waterborne Transportation Systems
- > Computational Free Surface Hydrodynamics
- > Maritime Safety and Risk
- > Modelling and Optimisation in Design

During the first two semesters, you will work in a team to tackle projects on a relevant subject and present findings to an industrial panel.

### CONTACT

Professor Peilin Zhou  
e: peilin.zhou@strath.ac.uk

## OFFSHORE RENEWABLE ENERGY

Global warming and environmental protection are the biggest challenges facing the human race. Sustainable engineering solutions are increasingly important, particularly the search for offshore renewable energy sources. Graduates of this course will be expected to play a significant role in exploiting this crucial resource.

The course is designed for experienced or newly-qualified engineers in Naval Architecture, Marine Engineering, Mechanical Engineering, Civil Engineering, Electrical Engineering or other related disciplines.

### Curriculum

You undertake an integrated programme of both generic and specialist taught modules along with industry-relevant projects. The generic modules are detailed on pg 16; the specialist modules in Offshore Renewable Energy are:

- > Energy Resources and Policy
- > Electrical Power Systems
- > Renewable Marine Energy Systems
- > Finite Element Analysis of Floating Structures

### CONTACT

Professor Peilin Zhou  
e: peilin.zhou@strath.ac.uk



## RESEARCH FACT FILE RENEWABLE ENERGY

A team of renewable energy experts led by Cameron Johnstone at the Department of Mechanical Engineering's Energy Systems Research Unit has developed a new generation of marine turbines that could harness energy from the sea even in the very deepest waters. The CoRMaT's innovative design enables it to be placed in the sea where the current is strongest, allowing engineers to reap the full benefits of the sea's natural resources. Unlike conventional turbines, the Strathclyde machine has two rotors, turning in opposite directions, which make it very stable and removes the need for expensive, fixed foundations. Instead, it can be connected to the sea bed by a cable that moves with the flow of the tide, much like a kite flying on a windy day. The CoRMaT device is currently involved in a trial in the River Thames, which if successful, could eventually provide enough power for 35,000 homes.

## RENEWABLE ENERGY SYSTEMS AND THE ENVIRONMENT

Aimed at graduates with an engineering, technology or science background, the course responds to the growing awareness that quality of life must be balanced by the need for conservation of world resources, especially energy, and the protection of the environment. Focusing on the design and operation of the energy systems that provide the environments in which people live and work, the course produces professionals who understand this balance and who seek to harness energy resources in a sustainable and environmentally-friendly manner.

You will be introduced to the different energy resources (conventional, nuclear and renewable) and the systems which can be employed to harness these resources. This enables you to have a good technical understanding of the different energy technologies and to learn about the impact of energy on the environment and how that impact can be reduced. Working with students from other sustainable engineering courses, you will develop the multidisciplinary industrially-relevant skills necessary in the energy sector. This well-established course has been running for 20 years with large numbers of graduates now employed in the energy sector. The programme is accredited by the Institution of Mechanical Engineers, the Energy Institute and the Royal Aeronautical Society.

### Curriculum

You undertake an integrated programme of both generic and specialist taught modules along with industry-relevant projects. The generic modules are detailed on pg 16; the specialist modules for Renewable Energy Systems and the Environment are:

- > Energy Resources and Policy
- > Energy Systems Analysis
- > Electrical Power Systems
- > Energy Modelling and Monitoring

Your group project will focus on the evolution of an energy system from inception to completion, including an assessment of cost effectiveness and environmental impact.

### CONTACT

Christina Rossi  
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**e:** christina.rossi@strath.ac.uk

## SUSTAINABLE PRODUCT DEVELOPMENT

The issue of sustainable product development is of increasing significance in today's society. The course has been designed to provide high-calibre graduates with an in-depth understanding of sustainable product engineering in order to meet the increasing interests and global demand for qualified product engineering designers and product development project managers. The course is aimed at graduates in mechanical/manufacturing engineering, computer science or other product development-related courses who wish to develop skills in product engineering and development.

You undertake an integrated programme of both generic and specialist taught modules along with industry-relevant projects. The generic modules are detailed on pg 16; the specialist modules in Sustainable Product Development are:

- > Product Design Techniques
- > Sustainable Product Design & Manufacture

Together with a selection from the following optional modules:

- > CAED Systems
- > Product Modelling and Visualisation
- > Engineering Risk Management
- > Supply Chain Operations
- > People, Organisation and Technology

### CONTACT

**e:** [pgadmissions@dmem.strath.ac.uk](mailto:pgadmissions@dmem.strath.ac.uk)

## DID YOU KNOW

- Since 2000, there have been over 500 graduates from the Sustainable Engineering programme.
- Sustainable Engineering students can take advantage of 'Succeeding for the Workplace – Careers Workshops' and the Sustainable Engineering Annual Conference to develop their industrial networks.



# Department of Architecture

[www.strath.ac.uk/architecture](http://www.strath.ac.uk/architecture)

## RESEARCH DEGREES

MPhil, PhD

MRes Building Design and Management for Sustainability

## TAUGHT COURSES

MArch/PgDip

Advanced Architectural Design

MSc/PgDip

Advanced Architectural Studies

MSc/PgDip/PgCert

Building Design & Management\*

Urban Design

\* part of Faculty Sustainable Engineering Programme, see pg 16

The Department of Architecture has a vibrant postgraduate community and an undergraduate population of over 300. Staff specialise in a variety of disciplines and together with visiting staff provide a wide range of academic and professional expertise.

Described by the Royal Institution of British Architects (RIBA) as having a research portfolio of outstanding range and quality, the Department has achieved high gradings in successive Research Assessment Exercises with 40% of our research at 4\* and 3\* levels, putting Strathclyde in the top three or four architecture schools in the UK.

There is a clear identity for the Department's research activities within four broad research groupings, described below. These groups allow the diversity of students' interests to be focused within a Departmental research strategy aimed at enhancing architectural knowledge, while having a transformative impact on the built environment and contemporary architectural culture.

## RESEARCH

The Department receives research funding from the Engineering and Physical Sciences Research Council (EPSRC), the Economic and Social Research Council (ESRC), the Arts and Humanities Research Council (AHRC), government, the EU, industry and the construction professions.

Research in the Department offers a laboratory for informing education, research and knowledge exchange in the fields of Architecture and Urban Design through collaborations within the Faculty of Engineering, across the University, and by engagement with practice and links with specialists both inside and outside the University.

Research falls within four broad areas: Architectural Design, Urban Design, Sustainability and Technology, and Cultural Studies. Within these identified areas of expertise, the Department of Architecture is home to the following specialist research groups:

### ABACUS (advancing buildings and concepts underpinning sustainability)

The group focuses on the application of technology to help deliver a more sustainable built environment in response to government, industry and society needs. Research is closely linked with international and national targets for reducing social and environmental impacts (including carbon reduction, waste minimisation and reducing pollution), and promoting energy and resource efficiencies in an attempt to improve quality of life for all. The group operates clusters within which staff and postgraduate



research students focus on design, technology and sustainability aligned with the University's research strategy.

### Cultural Studies

Within the context of an architecture department and through teaching and research, Cultural Studies aims to embrace differing definitions of culture, at the core of which lies the history and theory of buildings and cities. The group explores how and why buildings and cities are produced and used, how they are represented and the meanings we attach to them and explores the relationships between architecture and fields as diverse as music, painting, literature, politics, economics, critical theory, media and visual culture.

### Design Thinking & Practice

The Department's design research group works on live projects and offers advice and consultation as well as design guidance. The Unit encourages critical debate and the testing of new ideas, taking them from the studio to architectural practice and industry and vice versa. It is committed to sharing the lessons learnt from research and development in order to inform positive change in the architectural design process. It is led by three leading practising architects/academics and recognises the need to align key areas of research activity with the needs of the profession, policy-makers and strategic decision-makers.

### Urban Design Studies Unit (UDSU)

The broad areas of expertise of the Unit are urban morphology, urban modeling at neighbourhood and public space scale, the relationships



between people and space, community engagement in urban renewal. Recent research focuses on generative urban processes at the scale of the neighbourhood, block and plot; and urbanism, the comparative study of urban form in different geographic locations and historic periods. The Unit offers consultancy on urban regeneration locally and internationally, as part of Urban Sustainability through Environmental Design network. Staff are widely published in International journals, have edited books and sit on the editorial boards of journals such as Environment and Planning B and Urban Design International. Some are members of groups such as the International Association for People Environment Studies, Environmental Structure Research Group and the Academy of Urbanism.

### CONTACT

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Postgraduate Research Secretary  
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## RESEARCH FACT FILE

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A team of 35 Architecture students undertook a regeneration project for the East End of Glasgow as part of their fifth-year course in Urban Design. Working with the community they created long and short-term visions of how the East End's future could be transformed. They looked at issues such as transport, the location and role of new urban centres such as the Barras, and design of street fronts and public spaces. Over the course of a year, they developed a number of detailed masterplans in consultation with residents and other stakeholders. Professor Sergio Porta and Dr Ombretta Romice of the Department of Architecture supported the students. Dr Romice said: "The quality of the students' work is extremely high, and will inform the debate about how sustainable design can be used in Scotland, as well as putting forward regeneration ideas for the East End specifically."

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## Building Design and Management for Sustainability

### MRes

This research degree is aimed at recent graduates who may be interested in pursuing research in this area (perhaps moving on to doctoral studies), as well as early to mid-career building and urban design-related professionals who are seeking a competitive edge in the workplace and the opportunity to bring strategic sustainable design and management thinking into their own modes of practice.

The course involves advanced knowledge of social, environmental and economic sustainability relating to the built environment, construction and project management, and discusses current design, management and practice methods.

### Curriculum

The research programme covers theoretical and practical aspects of:

- > Sustainability and the Built Environment
- > Construction and the Built Environment
- > Research Protocols in Science and Engineering

### Course Duration

12 months full-time; 36 months part-time

### Entry Requirements

Honours degree, or equivalent, in a relevant architecture, engineering, technology, or science discipline. Entry may be possible with other qualifications provided there is evidence of relevant experience and of the capacity of postgraduate study.

### Careers

The course will enhance postgraduates' preparations for their future careers, whether this is in research, industry or practice and help them work towards more effective and efficient career development.

### CONTACT

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## Advanced Architectural Design

MArch/PgDip  
(ARB and RIBA Part 2 Course)

The PgDip in Advanced Architectural Design represents the final stage of academic architectural education en route to Part 2 professional qualification. Subject to an invitation from and approval by the Course Director, satisfactory completion of all diploma work, and presentation of a clear and ambitious programme of work, students may extend their study for an additional three months in order to convert their Diploma into an MArch.

### Curriculum

The course covers current theoretical approaches to urban issues and architectural design. You will:

- > develop formal and technical architectural ability
- > undertake a comprehensive urban and/or architectural design project
- > demonstrate awareness of management procedures relevant to design practice
- > carry out a detailed examination of an issue or issues of particular architectural and/or urban significance

The course comprises studio design work, lectures, special projects and workshops. Classes include urban history and theory, mapping architecture, digital media, sustainability and environmental assessment and landscape design.

Studies are predominantly project-based and demand a high level of design ability. The course carries ARB/RIBA Part 2 Exemption for students who have already completed at least four years of full-time architectural study.

### Course Duration

MArch: 12 months full-time; PgDip: 9 months full-time

### Entry Requirements

First- or second-class Honours degree, or equivalent agreed academic standard, as well as the agreement of the Director of Studies that studio work is of an acceptable quality. Please note that without studio work of acceptable quality, a second-class Honours degree may not be sufficient for acceptance.

### CONTACT

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## Advanced Architectural Studies

MSc/PgDip

This course offers students a unique opportunity to broaden and deepen their architectural education unencumbered by professional examinations. It provides an open and creative learning environment that embraces historical, theoretical and practical work. This course is neither prescribed by the ARB nor validated by RIBA.

### Course Structure

The course comprises a core curriculum, optional classes and a student-led thesis, project or dissertation where you have the opportunity to specialise in one of the Department's renowned research areas such as architectural computing, urbanism, history and theory, and sustainability. Modules are supported by a lecture series at which notable architects and commentators set out the boundaries of the social, political, economic and architectural environment. Each part of the course is designed to provide an opportunity to develop projects related to your own interests at the frontier of architectural debate. Studies are seminar, lecture and project-based and demand a high level of academic and design ability.

### Curriculum

The core curriculum comprises:

- > design studio modules from the studio options available in Year 5 of the MArch course
- > two lectures series, Mapping Architecture 1 and 2, introducing a wide range of contemporary ideas about the built environment
- > field trip (in recent years to Berlin, London, Amsterdam, Florence and Marseille)
- > special projects introducing contextual ideas in fields such as Computing, Urbanism, Art, Engineering and Anthropology
- > taught course in Professional Studies

### Course Duration

MSc: 12 months full-time; PgDip: 9 months full-time

### Entry Requirements

First- or second-class Honours degree, or equivalent agreed academic standard as well as the agreement of the Director of Studies that studio work is of an acceptable quality.

### CONTACT

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# Urban Design

MSc/PgDip/PgCert

This course is designed for both practitioners and students to enhance the understanding of the city as a complex and dynamic system and to advance the skills of practical urban design. While the focus is on physical planning and the design of urban spaces and buildings, the various influencing factors are also carefully considered. The major topic is the European metropolis, or city region, within the context of globalisation. The Department and the course have an established partnership with Glasgow City Council which enriches the programme with challenges and realism.

## Course Structure

The course is delivered through studio work, lectures and seminars and a piece of research carried out by the student. The studio involves work on the urban design of a complex urban area, including the levels of the entire city, the neighbourhood and the individual public space defined by urban architecture. Lectures and seminars, delivered as compulsory and optional taught classes, normally run over two and a half days to allow for flexible booking by CPD and part-time students, and cover the following topics, relevant to the studio's design project:

- > typology and architecture
- > economics and real estate
- > politics and policy
- > building laws and design codes
- > transportation and infrastructure
- > landscape and recreation
- > history and theory
- > implementation methods and management
- > representation and visual communication

Successful completion of studio and classes leads to the award of a Postgraduate Diploma; the completion of an additional research element leads to the award of the MSc in Urban Design, which is accredited as a Specialist Course by the Royal Town Planning Institute.

## Course Duration

MSc: 12 months full-time; 24 months part-time  
PgDip: 9 months full-time; 18 months part-time  
PgCert: 5 months full-time, 9 months part-time

## Entry Requirements

An Honours degree, or equivalent, in a discipline related to the built environment and the city (eg architecture, planning, engineering, landscape architecture, sociology, history). Candidates with alternative professional experience may also be considered.

## Funding

Scholarships are offered on a competitive basis to well-qualified UK/EU graduates.

## CONTACT

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**PETE RUSSELL**

**MSc Urban Design**

I was looking to continue my education in an international setting and Strathclyde offered an established and award-winning Urban Design department with staff who showed interest in students and dedication to innovative urban design. The multicultural mix within the department makes it possible to encounter first-person experiences from across the world. The course has added urban design to my architectural and sociology background. Whether I choose to continue research into the subject as a PhD candidate or enter private practice, I have the training I need to understand society, the built environment and their interactions in part because of the education I received at Strathclyde. I'm now working for the Urban Design Studies Unit at the University. The Unit works to advance the field of urban design (something the course benefits from as well). We have research and consulting projects ranging from network analysis to current regeneration feasibility planning commissions.

# Department of Bioengineering

[www.strath.ac.uk/bioeng](http://www.strath.ac.uk/bioeng)

## RESEARCH DEGREES

MPhil, PhD

MRes

Biomedical Engineering  
Medical Technology

EngD

Medical Devices

## TAUGHT COURSES

MSc/PgDip/PgCert

Bioengineering  
Medical Devices



Bioengineering takes a multidisciplinary approach to solving problems in medicine and biology, based on the application of advances in science, engineering and technology. A major focus is to improve the quality of life of people with medical conditions that restrict independent living and integration within the community.

Bioengineering operates at the interface between engineering, medicine, and the life and physical sciences. This Department is a key centre for the development of multidisciplinary research projects in biomedical engineering and in the development and testing of medical devices. The last Research Assessment Exercise (RAE 2008) reconfirmed the Department's reputation for world-class research, encompassing early career researchers through to established staff. Sixty percent of research-active staff are rated as world- and internationally-leading.

The Department has developed a rich translational research environment which enables new talent to thrive and offers opportunities to develop innovative research programmes. The department has many collaborations with clinical, industrial and other academic partners on a global scale. This approach provides Bioengineering with the capability to provide excellent postgraduate education and provides our students with exposure to leading research set in a multidisciplinary landscape where technology is critical to the delivery of health.

The work of our research groups is underpinned by facilities and expertise in the enabling technologies of sensors and transducers, signal and image acquisition and analysis, materials testing and development, and design.

The Department hosts the following:

- > Doctoral Training Centre (DTC) in Medical Devices
- > Strathclyde Institute of Medical Devices (SIMD)

The Department is also a major partner in the following collaborative ventures:

- > Glasgow Research Partnership in Engineering
- > Health Technologies KTN
- > Research Academy of Bioactive Molecules and Materials
- > Glasgow Health Technology Cooperative

## Research Profile

The Department is an international centre of excellence for postgraduate research which is directed at applying the methods and ideas of engineering and the physical and biological sciences

## RESEARCH FACT FILE

A multidisciplinary research team from Bioengineering and the Industrial Control Centre (Department of Electronic & Electrical Engineering), along with staff from NHS Greater Glasgow and Clyde and the MAKO Surgical Corps of Fort Lauderdale, USA have established the Centre for Robotic Orthopaedic Surgery at Strathclyde. The Centre is engaged in the first randomised clinical trials outside the US of MAKO's RIO® Robotic Arm Interactive Orthopaedic System, which allows surgeons to perform a precise knee resurfacing procedure called MAKOplasty®. In support of this initiative the Bioengineering Department has established a surgical robotics research laboratory which includes an eight-camera VICON system, orthopaedic navigation systems, the RIO Robotic system and an operating couch.

in medicine and surgery. There is particular emphasis on clinically-related research, ranging from basic investigations to direct clinical applications.

Academic and academic-related staff are supported by visiting and honorary staff from industry and health care. The multidisciplinary expertise of staff underpins teaching and research; their original disciplines and expertise range from cell biology to mechanical engineering. The synergy produced by such staff diversity is crucial to the teaching and research success of the Department. The work of the department is bolstered by an increasing population of research assistants and research fellows supported on external grants.

External research is supported by funding from the research councils, the Scottish Government, charities and commerce and industry within the UK, EU and internationally in countries such as the US and Japan.

### Research Groups

There are three major research groups:

#### Rehabilitation Engineering

Rehabilitation Engineering is the application of scientific and engineering principles to research which is related to the musculo-skeletal system. Within Rehabilitation Engineering there are three main areas of research:

- > Biomechanics and Medical Robotics
- > Prosthetics and Orthotics
- > Motor Control and Neuroprosthetics

#### Medical Diagnostic Devices and Instrumentation

Within the MDDI theme we have a broad range of research activities from minimally invasive patient monitoring or rapid point of care (POC) diagnosis to the development of new innovative interventional technologies including heart valves, life support systems and implantable cardiovascular devices. All projects are coupled to new approaches in interventions or therapy. The main areas of research are:

- > • Minimally-invasive Diagnostics
- > • Sensors for Cell and Tissue Engineering/Implanted Devices
- > • POC patient Monitors
- > • Cardiovascular Devices
- > • Endoscopic Technologies

#### Cell, Tissue and Organ Engineering

Main areas of research within this group are:

- > Cellular Interactions with Material/Chemicals
- > Cell/Tissue Engineering
- > Hybrid Artificial Organs
- > Modelling of Artificial Organs

## RESEARCH DEGREES

MRes, MPhil, PhD, EngD

### Course Duration

MPhil/MRes: 12 months full-time; 21 months part-time

PhD: three years full-time; 55 months part-time

EngD: four years full-time

### Entry Requirements

MPhil/PhD: Normally an Honours degree in engineering or science, but those with other qualifications, eg unclassified medical and paramedical degrees, may also be admitted.

MRes/EngD: See following course entries.



**SHAILESH JOSHI**

**PhD Bioengineering**

Bioengineering at Strathclyde has an excellent reputation for research and offers interesting projects based on Biomechanics and robotics. I have been involved in the first trials of the MAKO RIO® Robotic Arm which is very exciting. My supervisor is most supportive and organises interaction with both industry and the Glasgow Royal Infirmary.

I come from Mumbai in India and I am enjoying life at Strathclyde very much. There is an amazing sports centre and the events at the Students' Union are very good. Glasgow is a great city. There are lots of fine Indian restaurants, and the city's cinemas show a wonderful range of international films, including regional Indian films. Glasgow has an incredible music scene. I play tabla (Indian drum) and have become involved in fusion music since I've been here.

I love both my studies and my life in Glasgow.

## Biomedical Engineering

### MRes

This conversion course is offered to graduates with an interest in developing a research career in an academic, industrial or clinical setting. It introduces biomedical engineering and provides extensive training in research methodology and practice.

### Curriculum

This credit-based modular degree comprises assessed instructional modules and project work.

#### COMPULSORY CLASSES

- > Engineering Science OR Medical Science
- > Professional Studies in Bioengineering
- > Research Methodology

#### OPTIONAL CLASSES

(minimum of one)

- > Biomedical Electronics
- > Biomedical Instrumentation
- > Introduction to Biomechanics
- > Clinical and Sports Biomechanics
- > Tissue Mechanics
- > Biomaterials and Biocompatibility
- > Regenerative Medicine and Tissue Engineering
- > Cardiovascular Devices
- > Prosthetics and Orthotics
- > Bio-signal Processing & Analysis

#### PROJECT

Students also undertake a research/development project, chosen from a pool of relevant industrial or clinical projects, and submit a thesis.

### Course Duration

12 months full-time

### Entry Requirements

First- or second-class Honours degree, or equivalent, in engineering, physical science, life science, medicine, or a profession allied to medicine.

### Funding

Some funding may be available. Please contact the Department for latest details.

### CONTACT

Professor Helen Grant

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## Medical Devices

### EngD

The Doctor of Engineering (EngD) in Medical Devices is a higher degree providing engineers and physical scientists with full research training at the life sciences interface (LSI) that is relevant to medical devices and related technologies. The course is delivered by staff of the EPSRC-funded Medical Devices Doctoral Training Centre (DTC). With colleagues from Engineering, the Life Sciences and Physical Sciences, and with input from clinical advisers from the NHS and elsewhere, the DTC offers a world-class research and training programme for some of the best graduate students in the UK.

### Curriculum

In addition to compulsory classes, students choose from a series of elective modules in Year 1, and undertake a short individual research project working in the laboratory and research group of their choice. On completion of these modules students progress to project work on a full-time basis. The programme includes a Strathclyde Postgraduate Enterprise course which enables students to explore issues in technology transfer, spin-out companies and fundraising. Participation in industry days and events in Medical Devices in the UK is also a feature of the course.

#### COMPULSORY CLASSES

- > Medical Science
- > Research Methodology
- > Professional Studies in Bioengineering
- > Biomedical Electronics
- > Biomedical Instrumentation
- > Advanced Techniques in Biomedical Research
- > Medical Genomics
- > Introductory Pharmacology

#### ELECTIVE CLASSES

- > Clinical Biochemistry
- > Introduction to Biomechanics
- > Clinical & Sports Biomechanics
- > Tissue Mechanics
- > Biomaterials & Biocompatibility
- > Regenerative Medicine & Tissue Engineering
- > Cardiovascular Devices
- > Prosthetics & Orthotics
- > Bio-signal Processing & Analysis
- > Advanced Techniques in Biochemistry
- > Advanced Techniques in Molecular Biology

#### INDIVIDUAL DOCTORAL RESEARCH PROJECT (Years 2–4)

A key feature of DTC research projects is their interdisciplinary nature: each project is co-supervised by academic staff from different scientific disciplines with expertise on a wide range of topics including drug delivery and bio-imaging, cell and tissue engineering and micro-devices, and many involve interaction with clinical groups or companies in the medical industries sector.

### Course Duration

Four years full-time

### Entry Requirements

First- or upper second-class Honours degree, or equivalent, in engineering or physical sciences.

## Medical Technology

MRes (online learning)

The course provides full training in research for those involved in the medical technology sector. It equips students with the basic knowledge and training in medical technology research and will enable them to apply this knowledge in their own research project. The research project is undertaken in the workplace with full supervision from University staff, supported by local supervisors.

This course is ideal for clinicians, scientists and engineers involved in the application, design and manufacture of medical technology. These include: medical doctors, surgeons, nurses, other professionals allied to medicine, life scientists, design and product engineers.

### Curriculum

This credit-based modular degree comprises assessed instructional modules and project work. The course is available by distance learning with web-based delivery of the instructional modules. Instructional classes are selected from the following compulsory classes and advanced study class options:

#### COMPULSORY CLASSES

- > Case Studies in Medical Technology OR Elements of Medical Science
- > Research Methodology in Healthcare
- > Project

#### ADVANCED CLASS OPTIONS

(choose minimum of two)

- > Orthopaedic and Cardiovascular Device Technology
- > Biomaterials and their Applications
- > Artificial Organ Technologies
- > Diagnostic Instrumentation

### Course Duration

12 months full-time; 24 months part-time

### Start Date

Open

### Entry Requirements

First- or second-class Honours degree, or equivalent, in engineering, science, medicine or a profession allied to medicine. Where possible, prospective students will be invited for interview.

### CONTACT

Professor Terry Gourlay  
**t:** +44 (0)141 548 2005  
**e:** terry.gourlay@strath.ac.uk

### Funding

A number of studentships are available via an EPSRC training package.

### Careers

Graduates find employment in academic, medical devices research or in industry.

### CONTACT

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### OLGA POSADA-ESTEFAN

#### PhD Bioengineering

To figure out how living organisms 'work' has always fascinated me. Having my first degree in Biomedical Engineering and an MSc in Biotechnology, I realised that Strathclyde's PhD in Bioengineering suited my profile and that I could really contribute to science and human care in my home country of Colombia with it.

The University is perfectly set up for research and I've found that the atmosphere is extremely collaborative and departments work together to ensure you can access the materials and information you need. The six months I've been a PhD student here have been one of the greatest experiences in my life.

People are very friendly and helpful; the work environment is great; you meet people from all over the world; and, even though it rains a lot, I love the city of Glasgow. I would definitely encourage people to come and study at Strathclyde.

## Bioengineering

MSc/PgDip/PgCert

This credit-based modular conversion course is designed to provide students with a broad training in bioengineering, a field of expertise bringing together engineering, medicine and the life and physical sciences. It is accredited by the Institute of Physics and Engineering in Medicine (IPEM). An IPEM-accredited MSc is normally required for those wishing to pursue careers as Clinical Scientists in the National Health Service.

### Curriculum

All students take instructional classes in the first two semesters; MSc students then complete a research or development project reported by a thesis. You also have the opportunity to visit local clinical centres and attend research seminars presented by visiting experts from the UK and overseas.

#### COMPULSORY CLASSES

- > Engineering Science OR Medical Science
- > Professional Studies in Bioengineering
- > Anatomy and Physiology (for students taking Engineering Science but who do not have the prerequisite background in Anatomy and Physiology)
- > Biomedical Electronics
- > Biomedical Instrumentation
- > Research Methodology
- > Project

#### ADVANCED CLASS OPTIONS

- > Clinical & Sports Biomechanics
- > Tissue Mechanics
- > Introduction to Biomechanics
- > Bio-signal Processing & Analysis
- > Biomaterials and Biocompatibility
- > Prosthetics and Orthotics
- > Cardiovascular Devices
- > Regenerative Medicine and Tissue Engineering

### Course Duration

MSc: 12 months full-time; 24 months part-time

PgDip: 9 months full-time; 21 months part-time

### Entry Requirements

MSc: First- or second-class Honours degree, or equivalent, in engineering, physical science, life science, medicine, or a profession allied to medicine.

PgDip: Normally a first degree, but other applicants will be considered.

### Funding

Some funded studentships may be available for MSc or PgDip candidates. Please contact the Department for details.

### Careers

Graduates find employment in the biomedical industry, in the NHS or in research.

### CONTACT

Professor Helen Grant

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## Medical Devices

MSc/PgDip/PgCert

Delivered by staff of the Doctoral Training Centre (DTC) in Medical Devices this course provides engineers and physical scientists with knowledge and understanding of the medical devices used in diagnosis and treatment of patients, to enable them to pursue a career in the medical device industry.

### Curriculum

Participants take compulsory and advanced class options as detailed for the EngD in Medical Devices, followed by a short research project carried out under the supervision of academic staff, often in collaboration with clinical groups or with industry.

### Course Duration

One year full-time or part-time

### Entry Requirements

First- or upper second-class Honours degree, or equivalent, in engineering or physical science.

### Funding

Funding for scholarships may be available. Please contact the Department for details.

### Careers

Graduates find employment in medical devices research or in the medical industry.

### CONTACT

Professor Helen Grant

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## Scholarship Programme

### International Excellence Awards

Bioengineering is pleased to offer 10 prestigious non-competitive scholarships for full-time international applicants to all the Department's MSc programmes. Recipients will benefit from an award up to £2,000. Successful recipients will be notified before the beginning of term.

### The China-Scotland Friendship Award

Bioengineering will offer this award worth £2,000 to a Chinese applicant of outstanding ability. The successful recipient will be notified before the beginning of term.

Home applicants may apply for a Postgraduate Student Awards Agency for Scotland (PSAS) funded scholarship which covers the cost of tuition fees on specific eligible courses.

### CONTACT

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# Department of Chemical & Process Engineering

[www.strath.ac.uk/chemeng](http://www.strath.ac.uk/chemeng)

## RESEARCH DEGREES

PhD, MPhil, MRes

## TAUGHT COURSES

MSc/PgDip/PgCert

### Full-time Courses

**Advanced Chemical & Process Engineering  
Chemical Processing\***

### Part-time Courses

**Chemical Technology and Management  
Process Technology and Management**

\* part of Faculty Sustainable Engineering Programme, see pg 16



The Department has an excellent reputation for its research output, its close links with industry and for its innovative approach to developing undergraduate and postgraduate courses for industry-based students.

There are excellent computing facilities based on access to the high-performance computing cluster shared within the Faculty of Engineering. Purpose-built, state-of-the-art research laboratories are fully equipped to provide a first-rate working environment and excellent research facilities. We also have access to Faculty's new £3 million Advanced Materials Research Laboratory. The Department is justifiably proud of its close liaison with industry, through company sponsors of our award-winning distance learning programmes and a number of Knowledge Exchange projects, both of which ensure that our research is industrially relevant. With extensive facilities for testing and analysis, the Department has the knowledge and capability to produce a variety of new materials for a wide range of applications.

## Research Areas

The Department of Chemical & Process Engineering is a centre of research excellence in nanoscale science and engineering, specialising in Nanostructured Materials, Biomolecular Engineering and Low Carbon Technology. These themes are interdisciplinary, involving collaboration across several engineering and science departments, and are supported by underpinning strengths in multi-scale modelling, and optical and adsorption measurement. They are recognised as being of key strategic importance at both national and international level in the quest to meet the challenges of energy provision, healthcare and nutrition. Research is concerned with major issues of chemical, energy and life science industries.

### NANOSTRUCTURED MATERIALS

Key areas of research include the development, characterisation, measurement and modeling of novel nanostructured materials. Specific research areas include:

- > nanostructured carbon, silicates and framework materials
- > nanomaterials at bio-interfaces
- > adsorption fundamentals and measurement
- > optical diagnostics of nanostructures

## RESEARCH FACT FILE

Professor Peter Hall's group in the Department of Chemical Engineering is contributing its knowledge of advanced energy storage techniques within a research consortium of six universities with the objective of reducing the weight of battery power which foot soldiers currently fighting in Afghanistan have to carry. Over the past four years they have produced prototype Lithium oxygen batteries with energy densities of greater magnitude than anything available commercially and new supercapacitors based on ionic liquids. The work has mainly focused on controlling the structure of carbon-based materials at the nano scale and in a series of recent publications they have shown the very strong relationships between materials structure and storage device performance. To the soldier this will mean more power with a significant reduction in weight and greater portable energy. One new innovation that they are researching is the use of flexible woven carbon fibres as the electrodes of the devices to produce wearable energy storage.

- > interfacial nanostructures
- > nanoparticle engineering
- > polymer membranes
- > molecular modelling
- > materials for electrochemical devices

#### BIOMOLECULAR ENGINEERING

Key areas of research include bioanalytical technologies, biotherapeutics engineering, protein aggregation and assembly. Specific research areas include:

- > enzymatic biocatalysis
- > crystallisation process technology
- > bioprocess analytical technology
- > high pressure processing
- > colloidal and soft matter engineering
- > molecular modeling

#### LOW CARBON TECHNOLOGY

Key areas of research include low carbon energy devices, and gas processing. Specific research areas include:

- > fuel cells, batteries and supercapacitors
- > hydrogen storage
- > carbon capture

#### MULTI-SCALE MODELLING

Key areas of research: theory and simulation of interfacial systems, aggregation processes in bulk and at interfaces, colloidal and soft matter, granular material.

#### RESEARCH ENVIRONMENT

Chemical engineering research is inherently interdisciplinary, focused on recent developments at the interface of science and engineering. The aim is to improve knowledge transfer between science, engineering and industrial research and development to enable developments in fundamental sciences, such as physics,

chemistry and biosciences, to be translated into rapid developments in engineering of new processes and products.

Our research students come from all over the world to participate in our active research programme in a vibrant culture of creativity, scholarship and innovation. During their research study, students have the opportunity to select credits in specialised scientific and engineering subjects and to develop their managerial skills through interaction with the Department's highly successful IGDS (Integrated Graduate Development) scheme.

A number of studentships are available for well-qualified applicants, including Faculty studentships and training packages funded by the Engineering and Physical Sciences Research Council.

The Department's comprehensive suite of experimental facilities includes:

- > thermogravimetric analysis
- > differential scanning calorimetry/high-pressure DSC
- > temperature programmed desorption and mass spec
- > static and multiangle dynamic light scattering/3D DLS
- > CD, FTIR and UV-vis spectrometers
- > cavity ring-down spectrometer
- > optical microscopy and image analysis
- > cell test systems
- > gas chromatography, gas adsorption and gas separation
- > facilities for the large-scale production of hollow polymer fibres
- > membrane bioreactor
- > very high isostatic presses
- > high-temperature furnaces
- > high-pressure viscometer
- > rheometers
- > bench-top continuous reactors

#### CONTACT

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### ULRICH SCHACHT

#### PhD Chemical Engineering

After finishing my Bachelor degree in Chemical Engineering in Germany I wanted to study in Europe, because a good knowledge of English is more and more important these days. The University of Strathclyde was very appealing due to its location, the language and its good overall ranking.

Studying at Strathclyde has definitely been an international experience in that my fellow students come from seven countries around the world. I have had the opportunity to work on every topic in Chemical Engineering, and a good library and the access to research journals enabled me to read, learn and study about any topic in my area. After finishing my MSc I was offered a fully funded PhD within the Chemical Engineering Department, which I am still busy with today.



# Advanced Chemical & Process Engineering

MSc/PgDip/PgCert (full-time)

This modular programme is primarily aimed at engineering students from the UK and overseas who wish to develop careers in the oil, gas, process and chemical industries. The programme meets accreditation requirements for the Institute of Chemical Engineers which would allow graduates to apply for Chartered Engineer status. It focuses on Advanced Chemical Engineering with opportunities to develop core and multidisciplinary skills that will enable graduates to meet the challenges of the future.

It uses a strong project-based approach and is relevant to the recruitment needs of a broad range of employers throughout the chemical and process sectors.

## Curriculum

The MSc requires eight taught modules, a group design project and an individual research project, working with our team of leading researchers on chemical engineering issues of the future. The Diploma requires eight modules and a Group Project and the Certificate six modules. The key areas of the programme content are as follows:

### CHEMICAL & PROCESS ENGINEERING

- > Process Design Principles
- > Safety Management Practices
- > Energy Systems
- > Colloid Engineering
- > Multi-Phase Processing
- > Petroleum Engineering Environmental Control Technologies
- > Process Safety Design
- > Emerging Technologies Programming & Optimisation

### MULTIDISCIPLINARY SKILLS

- > Project Management
- > Risk Management

- > Information Management
- > Understanding Financial Information

Candidates wishing to cover the same scope of subjects but be involved in a multidisciplinary Sustainable Engineering programme should apply for the MSc Sustainable Engineering: Chemical Processing pathway (see pg 16).

## Course Duration

MSc: one year full-time  
PgDip: nine months full-time  
PgCert: six months full-time

## Entry Requirements

An Honours degree, or equivalent, in a relevant engineering, technology or science discipline. Entry may be possible with other qualifications provided there is evidence of relevant experience and ability to study at an advanced level.

## Careers

The continued success of the chemical and process industries means there is growing demand for high-calibre graduates who can develop and apply advanced process technologies in a highly competitive business environment. This programme is particularly relevant to graduates in the early stages of their career or those who may wish to progress to a research degree.

## CONTACT FOR FULL-TIME COURSE

Brian Dickson  
t: +44 (0)141 553 4131  
e: [brian.dickson@strath.ac.uk](mailto:brian.dickson@strath.ac.uk)

### KIT MEI TAN

MSc Graduate

The Department's distinguished reputation, valuable ties to industry and great career prospects were what attracted me to study Chemical Engineering at Strathclyde. The variety of taught modules offered enabled me to select the subjects which were of most interest and which would benefit my future career.

There is a very friendly atmosphere throughout the Department, great working environments and the staff were supportive and always available for advice. I had the opportunity to work in industry through my group project; the experience was highly beneficial as it helped me gain a perspective on what I wanted to do when I finished my studies. The transferrable skills and knowledge gained on the course and my solo project are what I consider to be of most value, and applicable in my present work. I have been lucky to be able to remain at Strathclyde and continue my studies for a PhD in the field of bioengineering.



## Chemical Technology and Management

MSc/PgDip/PgCert (part-time distance learning)

This part-time distance learning programme is based on a partnership between the Department of Chemical & Process Engineering and the Royal Society of Chemistry (RSC). It will be equally attractive to younger graduates at an early stage in their careers and to graduates with more experience who wish to update their technical knowledge and skills. Students may find the mix of technology and management an attractive and more relevant alternative to MBA-type qualifications.

The course is directed at people working as chemists in Research and Development, and to those in manufacturing and business management roles in the UK and overseas. The programme meets the management development needs of members of the RSC and those working in the chemical, pharmaceutical and process industries. The overriding objective is to enable students to perform better in their jobs by continuing their professional development; the courses are designed not only to impart relevant technical knowledge, but also the management skills necessary to make the most of that knowledge.

### Curriculum

The MSc requires 12 taught modules and a work-based project (equivalent to six modules). The Diploma requires 12 modules and the Certificate six modules. Each module requires a study time of around 100 hours, inclusive of workshop attendance, over a six-month period. You will study the basics of finance, marketing and people management alongside the technical disciplines. A typical study programme would include modules in:

- > Management of Technological Innovation
- > Laboratory Management
- > Intellectual Property Rights
- > Process Design
- > Project Management
- > Safety and Loss Prevention
- > Accountancy and Finance
- > General and Strategic Management
- > Manufacturing Technology
- > IT Strategies

There are also a small number of intensive workshops which provide direct contact between tutors and participants and enable you to use University laboratory and computing facilities.

### Course Duration

MSc: three years part-time  
PgDip: two years part-time  
PgCert: one year part-time

### Entry Requirements

Honours degree from a relevant engineering, technology or science discipline. Entry may be possible with other qualifications with evidence of relevant experience and capability of advanced study.

### Careers

This course will enable you to enhance your career progression by extending your knowledge and understanding in key aspects of technology, management and business, and information technology and to apply this expertise to the early benefit of your employer.

## Process Technology and Management

MSc/PgDip/PgCert (part-time distance learning)

This part-time modular programme is primarily for industry-based students from the UK and overseas focusing on Process Technology/Management and Business/IT. The programme meets accreditation requirements for the Institute of Chemical Engineers. It uses a strong project and work-based approach and operates mainly by distance learning to provide a wide coverage and to enable participants to spend the minimum time off-the-job.

This programme meets the development needs of graduates from a range of engineering, technology and science disciplines (eg chemical engineers, mechanical engineers, control engineers, chemists) and is relevant to a broad range of type and size of company throughout the chemical and process sectors.

### Curriculum

The MSc requires 12 taught modules and a work-based project (equivalent to six modules). The Diploma requires 12 modules and the Certificate six modules. The key areas of the programme content are weighted as follows:

- > Process Technology 50%
- > Chemical Technology 25%
- > Business, Management and IT 25%

For graduates in disciplines other than chemical engineering, foundation or bridging modules in chemical engineering are available.

This programme is only available on a part-time basis. Candidates wishing to cover the same scope of subjects on a full-time basis should apply for the MSc Advanced Chemical and Process Engineering or MSc Chemical Processing (see pg 16).

### Course Duration

MSc: three years part-time  
PgDip: two years part-time  
PgCert: one year part-time

### Entry Requirements

Honours degree, or equivalent, in a relevant engineering, technology or science discipline. Entry may be possible with other qualifications provided there is evidence of relevant experience and ability to study at an advanced level.

### Careers

The continued success of the chemical and process industries means there is growing demand for high-calibre graduates who can develop and apply advanced process technologies in a highly competitive business environment. This programme is particularly relevant to younger graduates in the early stages of their careers, but it is also an excellent option for more experienced graduates wishing to update their technical expertise or who find the mix of technology and management a more relevant alternative to MBA-type qualifications.

### CONTACT FOR PART-TIME COURSES

Kenneth Moffat  
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# Department of Civil Engineering

## (incorporating the David Livingstone Centre for Sustainability)

[www.strath.ac.uk/civeng](http://www.strath.ac.uk/civeng)

### RESEARCH DEGREES

MPhil, PhD

MRes Programmes

Climate Change Adaptation

Geo-environmental Engineering

Integrated Pollution Prevention and Control

### TAUGHT COURSES

MSc

Environmental Engineering

Environmental Entrepreneurship

Environmental Forensics

Environmental Health

Environmental Science

Geotechnics

Global Water Sustainability

Hydrogeology

Sustainability and Environmental Studies

### CONTACT FOR RESEARCH DEGREES

Lisa Lyons

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### CONTACT FOR TAUGHT COURSES

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The Department combines the strengths of Civil Engineering, Environmental Health, Sustainability and Environmental Studies, providing the highest quality professional training linking the built environment with the natural environment. Our multidisciplinary Department has a large international student population and a global research profile, with almost two-thirds of our research output rated as 'world-leading or internationally excellent' in the 2008 Research Assessment Exercise.

The Department leads the Joint Research Institute (JRI) in Environmental, Infrastructure and Transportation Engineering formed under the Glasgow Research Partnership in Engineering (GRPE). The GRPE was funded to promote multidisciplinary collaboration between the leading research groups in the West of Scotland and provide world-class joint research facilities. Member universities of the GRPE include Strathclyde, Glasgow, Glasgow Caledonian and the University of the West of Scotland. The Department is also an active member of the JRI in Mechanics of Materials, Structures and Bioengineering.

The success rate of our graduates has always been excellent. Many of our innovative postgraduate courses relate to areas where there are skill shortages and career prospects remain strong even in times of economic downturn.

### RESEARCH FACT FILE

Professor Minna Karstunen is an internationally-leading researcher in soft soil engineering. She is the Leader of the MSc in Geotechnics. Her industrial experience relates to the design of roads, tunnels and bridge foundation on very soft soils. She has coordinated a number of EC-funded Research Training Networks including SCMEP (Soft Soil Modelling for Engineering Practice) and AMGISS (Advanced Modelling of Ground Improvement on Soft Soils). Since 2009, she has been leading two major European-funded consortia at Strathclyde:

- > GEO-INSTALL (Modelling Installation Effects in Geotechnical Engineering) is a €1.28 million industry-academia partnership project involving research collaboration with some of the top universities in the field as well as world-leading research institutes and companies (PLAXIS BV and Keller Ltd).
- > €0.38 million International Research Staff Exchange Scheme (GEO-EXCEL) facilitates research collaboration between a number of European and Latin American universities.

Professor Karstunen's innovative work related to the modelling of complex behaviour of soft natural soils is supported by pioneering experimental work at Aalto University, Finland, where she is a Visiting Professor.

## THE DAVID LIVINGSTONE CENTRE FOR SUSTAINABILITY

[www.strath.ac.uk/dlcs](http://www.strath.ac.uk/dlcs)

Civil Engineering incorporates the David Livingstone Centre for Sustainability (DLCS), which promotes cross-disciplinary programmes in teaching and research in the areas of environment and sustainability. DLCS has created a multidisciplinary framework for the research, training and practice of sustainability – MSc programmes allow classes to be taken from other Faculties across the University.

The Centre's teaching and research programmes aim to enhance the long-standing international reputation of the University as 'the place of useful learning'. Its diverse expertise profile, comprising staff from engineering, science and social sciences, provides a robust basis for its evolution as a centre of excellence in sustainability studies. With a long-established record since 1992 the Centre produces top-quality graduates to meet the demands of the environmental agencies, businesses, education and the construction industry both in the UK and internationally. In addition its Open Access classes are available on an individual basis for those wishing to undertake professional development.

There is a vibrant cohort of postgraduate and PhD students. DLCS is a gateway to a unique portfolio of postgraduate programmes which draw on the wealth of expertise and research on various aspects of sustainability that are available across the University.

### Research

The Department's research and knowledge exchange activities come under two multidisciplinary research groups. The research in these groups lies not only within the traditional fields of civil engineering, but also in environmental health, contaminant transport, environmental remediation, climate change, hydrogeology, environmental forensics, sustainable development, environmental policy, Strategic Environmental Assessment, environmental microbiology and international studies.

Both groups are involved in a number of international and national research training initiatives such as the EC-funded Marie Curie Research Training Network, Advanced Modelling of Ground Improvement on Soft Soils, (coordinated by the Department), ALERT Geomaterials and the Malawi Millennium project.

### INFRASTRUCTURE RESEARCH GROUP

Research in the group is focused on the following interdisciplinary areas:

- > modelling the mechanical behaviour of soils and rocks
- > understanding deep flow systems for carbon sequestration, hydrocarbon exploitation and radioactive waste disposal
- > assessment of flood defences
- > performance of structures
- > design of improved tools and strategies for monitoring and analysis of ground and structural deformations

### ENVIRONMENT RESEARCH GROUP

Research in this group is clustered around the following key themes:

- > Water Resources
- > Environmental Engineering, Sustainability and Biotechnology
- > Environmental Health and Sanitation
- > Transport Planning and Sustainability
- > Environmental Forensics

### RESEARCH DEGREES

MPhil and PhD degrees involving independent research are available within the Department's two groups.

### Entry Requirements for Research Degrees

MPhil/PhD: Candidates with a first- or upper second-class Honours degree (or equivalent) in any discipline, who are able to formulate an innovative research proposal in consultation with their potential supervisors, are invited to apply. Previous research/industrial experience is an advantage but is not essential.

MRes: see following course entries

## MRes (Masters by Research) Programmes

MRes degrees comprise a 33% taught element and a supervised thesis project of 67%. Students take compulsory modules plus a choice from any of the Department's postgraduate courses. Examples of optional modules include, but are not limited to:

- > Air Pollution Impact Assessment
- > Aquifer Mechanics
- > Business Strategy and the Environment
- > Climate Change Mitigation and Adaptation

### UPAKA SANJEEWA RATHNAYAKE

PhD in Civil Eng

I completed my undergraduate studies at the University of Peradeniya in my home country of Sri Lanka. This was followed by an MEng in Civil Engineering at Hokkaido University, Japan. Funding was important to me in selecting a university for my PhD and I was fortunate to receive a scholarship which pays for my study here. Strathclyde is a great university for engineering and the department is a pleasant working environment with supportive staff. I am really enjoying my time in Glasgow and I've met people from across the globe including many fellow Sri Lankans. I've even learned to swim in the University's own pool!



- > Environmental Impact Assessment
- > Fundamentals of Environmental Forensics
- > Geographical Information Systems (GIS)
- > Hydrogeology
- > Pollution and Rehabilitation of Degraded Ecosystems
- > Principles of Environmental Microbiology
- > Principles of Sustainability
- > Contaminated Land
- > Science, Technology and Innovation Policy
- > Site Investigation and Risk Assessment
- > Transport, Development and Sustainability
- > Water and Waste Water Treatment Design

### MRes Entry Requirements

First- or second-class Honours degree from a UK university (or equivalent overseas qualification) in an engineering, life science or earth science discipline.

### Careers

Graduates can be found working for the Scottish Environment Protection Agency and other government agencies, environmental management consultancies as well as in industry, particularly in the construction sector and related industries. On successful completion of the MRes research project, it may be possible for good quality researchers to transfer to the PhD programme (ie the MRes would be equivalent to the first year of a PhD), which could lead to a career in academia.

## Climate Change Adaptation

### MRes

This course aims to provide advanced study in adaptation for climate change from the perspective of both businesses and the engineering profession. Students have access to laboratory facilities providing the hands-on experience essential for understanding and designing projects for sustainable development and climate change adaptation.

This course is designed for engineering graduates and public and private sector employees who wish to upgrade their skills to be able to tackle the complex issues relating to sustainable development, and to design engineering options for climate change adaptation.

## International Excellence Award

The Department of Civil Engineering/DLCS is offering a prestigious £1,000 scholarship to attract the very best international students to our innovative MSc and MRes courses.

For more information and how to apply for the awards visit:  
[www.strath.ac.uk/civeng/pg/excellenceawards](http://www.strath.ac.uk/civeng/pg/excellenceawards)

### CONTACT

Pippa Tawse  
t: +44 (0)141 548 3170  
e: [pippa.tawse@strath.ac.uk](mailto:pippa.tawse@strath.ac.uk)

### Compulsory Modules

- > Atmospheric Pollution Impact Assessment
- > Climate Change Mitigation and Adaptation
- > Environmental Business Strategy
- > Research Protocols for Science and Engineering

## Geo-Environmental Engineering

### MRes

Geo-environmental engineering is a wide-ranging subject which combines geotechnics, microbiology, chemistry and hydrogeology among other things. This course is unique in Scotland and the UK for being taught by a group of professionally qualified civil engineers, chemists and microbiologists all employed full-time in the one university department. Our unique set of laboratory facilities provides hands-on experience which is essential for understanding the multi-disciplinary topics which constitute geo-environmental engineering.

The course will appeal to graduates in fields such as civil engineering, environmental engineering, environmental science, geography, environmental protection and biological sciences. The course is also suitable for graduates already employed in overseas government ministries and other public bodies related to engineering, earth sciences, environmental protection, sustainable development, environmental impact assessment, ecology, geotechnical engineering, solid waste management, recycling and more.

### Compulsory Modules

- > Contaminated Land
- > Hydrogeology
- > Research Protocols for Science and Engineering
- > Site Investigation and Risk Assessment

## Integrated Pollution Prevention and Control

### MRes

With bigger companies routinely employing environmental managers to deal with issues such as the ISO 9001/ISO 14001 and new pollution prevention and control (PCC) legislation, this MRes is extremely relevant. It supplies the multidisciplinary skills required to conduct IPPC projects which are not provided by typical undergraduate courses in Environmental Health, Public Health, Chemistry, Earth Sciences and the Life Sciences.

This course will appeal to students from a range of undergraduate programme such as civil engineering, environmental engineering, environmental science, chemistry, environmental health, environmental protection and biological sciences.

### Compulsory Modules

- > Air Pollution Control
- > Environmental Management Systems
- > Research Protocols for Science and Engineering
- > Waste Management and Landfill Design

## TAUGHT COURSES

### Course Duration

12 months full-time; 24 months part-time

MSc students undertake a dissertation after successful completion of the taught component (June – August).

### Open Access/Continuing Professional Development

UK students have the option of undertaking classes on an individual basis. Students who demonstrate sufficient success in single modules may be allowed to progress towards a Postgraduate Certificate or Diploma.

### Accreditation

All\* our MSc courses are professionally accredited by the Institution of Civil Engineers (ICE) enabling students to progress to Chartered Engineer (CEng) status. These innovative courses (some are unique in the UK and Europe) already involve extensive industrial collaboration and further partnerships with companies, government agencies and NGOs are being developed.

\*Except for MSc Environmental Health which is accredited by REHIS.

## Scholarship Programme

Applicants of outstanding calibre to our MSc courses are eligible to apply for a range of international scholarships offered by the University including:

- > Commonwealth Shared Scholarship Scheme
- > Palestinian Scholarship Scheme
- > University of Strathclyde International Scholarships (up to £3,000)

Visit [www.strath.ac.uk/civeng/pg/funding](http://www.strath.ac.uk/civeng/pg/funding) for further details

### International Excellence Award

The Department of Civil Engineering offers a prestigious £1,000 scholarship to attract the very best international students for our innovative MSc and MRes courses.

For information and how to apply visit

[www.strath.ac.uk/civeng/pg/excellenceawards](http://www.strath.ac.uk/civeng/pg/excellenceawards)

### CONTACT

Pippa Tawse

e: [pippa.tawse@strath.ac.uk](mailto:pippa.tawse@strath.ac.uk)

### PSAS Awards

(SAAS funding – Home/EU applicants only)

A limited number of awards covering tuition fees are available to high-calibre students across all our MSc courses.

## Environmental Engineering

### MSc

This course meets the needs of global urban regeneration, environmental protection, contaminant remediation and infrastructure investment portfolios. It is suitable for graduates from engineering, earth sciences, environmental management or other relevant disciplines. Candidates from industry may continue in employment and complete the MSc in part-time mode.

### Curriculum

#### COMPULSORY MODULES

- > Contaminated Land
- > Environmental Impact Assessment
- > Hydrogeology
- > Practical Environmental Chemistry
- > Research Protocols for Science and Engineering
- > Site Investigation and Risk Assessment
- > Waste Management and Landfill Design

#### OPTIONAL MODULES

(five to be chosen)

- > Air Pollution Control
- > Atmosphere Pollution Impact Assessment
- > Climate Change Mitigation and Adaptation
- > Ecology, Biodiversity and Sustainability
- > Environmental Business Strategy
- > Fundamentals of Environmental Forensics
- > Geographical Information Systems (GIS)
- > Ground Improvement and Reinforcement
- > Pollution and Rehabilitation of Degraded Ecosystems
- > Principles of Environmental Microbiology
- > UK and EU Environmental Law

### Entry Requirements

First- or upper second-class Honours degree from a UK university (or equivalent overseas qualification) in engineering, earth sciences, environmental management or other relevant disciplines.

### Careers

The career prospects of graduates are excellent due to significant skills shortages in the environmental engineering field both in the UK and overseas.





# Environmental Entrepreneurship

MSc

This course aims to create a whole new generation of 'ecopreneurs' with the skills to launch new ventures, strategies, products, and technologies that address society's environmental and natural resource problems. The course is not just about green industries. It is also about developing 'win-win' business opportunities, which simultaneously protect the environment and save money in any kind of organisation. This innovative MSc – the first of its kind in Europe – is the result of a cross-faculty collaboration between the David Livingstone Centre for Sustainability and the Hunter Centre for Entrepreneurship in Strathclyde Business School. The course is offered to students from all disciplinary backgrounds.

## Curriculum

### COMPULSORY MODULES

#### Department of Civil Engineering

- > Client-Based Environmental Entrepreneurship in Practice
- > Environmental Business Strategy
- > Qualitative and Quantitative Research Methods

#### Hunter Centre for Entrepreneurship

- > Entrepreneurial Capital
- > Opportunity and Creativity

### OPTIONAL MODULES

(six to be chosen)

#### Department of Civil Engineering

- > Climate Change Mitigation and Adaptation
- > Ecology, Biodiversity and Sustainability
- > Environmental Management Systems
- > Pollution and Rehabilitation of Degraded Ecosystems
- > Principles of Sustainability
- > Recent Trends in Technological Progress
- > Science, Technology and Innovation Policy

#### Hunter Centre for Entrepreneurship

- > Entrepreneurship, Innovation and Commercialisation

#### Department of Mechanical Engineering

- > Energy Resources and Policy

#### Department of Economics

- > Pollution Control Policy

#### The Law School

- > UK and EU Environmental Law

For students interested in renewables it may also be possible to choose the following options:

#### Department of Electronic and Electrical Engineering

- > Wind Power Technology

#### Department of Naval Architecture and Marine Engineering

- > Renewable Marine Energy Systems

#### Department of Mechanical Engineering

- > Electrical Power Systems
- > Energy Modelling and Monitoring

## Entry Requirements

First- or upper second-class Honours degree from a UK university (or equivalent overseas qualification) in any discipline.

## Careers

Graduates may follow a broad range of careers, for example in manufacturing, the food industry, tourism, engineering, retailing, business, energy and technology sectors, in local or central government, or in NGOs. They may follow a consultancy path or choose to start their own business. Graduates can take advantage of practical help from the Strathclyde Entrepreneurial Network ([www.strath.ac.uk/sen](http://www.strath.ac.uk/sen)).



**ZIKRI ZAINAL**

**MSc Environmental Entrepreneurship**

The main reason I came to Strathclyde is to gain the knowledge necessary to be involved in 'green' business. What attracted me to the MSc in Environmental Entrepreneurship was gaining practical experience by being attached to a green business. I was fortunate to be accepted as an environmental intern at Glasgow Wood Recycling – a social enterprise based in Glasgow that reclaims wood and recycles it into furniture and other bespoke items. I have been involved in two events and have written a press release, proposed an environmental management system and have been heavily involved in marketing their services. It has been a fruitful experience. On completion of my course I hope to start a green business in my home country of Malaysia.

Apart from the learning experience, I'm a keen walker and Scotland is built for walking. I'm from Malaysia and used to trekking through rain forests so hiking in Scotland is a nice change.

## Environmental Forensics

MSc

This MSc harnesses Strathclyde's world-leading expertise in the emerging discipline of Environmental Forensics which aims to prove, to the satisfaction of a court of law, who is responsible for instances of pollution. The course develops students' ability to make sound judgements, within a legal context, in relation to the impact of human activity on the environment. It is suitable for students from a range of backgrounds including earth science, engineering and environmental management.

An investment of over £1 million was recently made by the University to provide state-of-the-art research laboratory facilities for Environmental Forensics, to the highest international standard.

### Curriculum

#### COMPULSORY MODULES

##### Department of Civil Engineering

- > Contaminated Land
- > Fundamentals of Environmental Forensics
- > Principles of Environmental Chemistry
- > Practical Environmental Chemistry
- > Research Protocols for Science and Engineering
- > Site Investigation and Risk Assessment

##### Centre for Forensic Science

- > Fundamentals of Forensic Science

##### The Law School

- > UK and EU Environmental Law

#### OPTIONAL MODULES

(three to be chosen)

- > Atmospheric Pollution Impact Assessment
- > Climate Change Mitigation and Adaptation
- > Geographical Information Systems
- > Hydrogeology
- > Pollution and Rehabilitation of Degraded Ecosystems
- > Principles of Environmental Microbiology
- > Waste Management and Landfill Design

### Entry Requirements

First- or upper second-class Honours degree from a UK university (or equivalent overseas qualification) preferably in a science, earth science or engineering discipline, but other disciplines (particularly Law) may be considered.

### Careers

Engineering consultants, those in the legal profession and environmental consultants who have a thorough comprehension of this interdisciplinary approach are increasingly in demand. As this is the first MSc in Environmental Forensics in the UK, the career prospects of graduates are excellent.

## Environmental Health

MSc

Environmental Health is the assessment and management of environmental influences on human health. The link between Environmental Health, Civil and Environmental Engineering and specialist Environmental Science/Management teaching at Strathclyde represents a globally unique combination that directly addresses many of the changing and emerging threats to public health across the developed and developing world. Students learn about interdisciplinary science and engineering-based approaches for effective management of risks to human health from a wide range of influences in the built and natural environment. This course is accredited by the Royal Environmental Health Institute of Scotland (REHIS).

### Curriculum

#### COMPULSORY MODULES

- > Acoustics
- > Atmospheric Pollution Impact Assessment
- > Contaminated Land
- > Food Inspection and Control
- > Food Safety and Hygiene
- > Infection and Vector Control
- > Introduction to Health and Safety
- > Meat Hygiene and Inspection
- > Occupational Health and Toxicology
- > Public Health Studies
- > Waste Management and Landfill Design

#### OPTIONAL MODULES

(one to be chosen)

- > Air Pollution Control
- > Climate Change Mitigation and Adaption
- > Environmental Impact Assessment
- > Housing Policy and Law
- > Principles of Environmental Microbiology
- > Qualitative and Quantitative Research Methods
- > Site Investigation and Risk Assessment

### Entry Requirements

First- or upper second-class Honours degree from a UK university (or equivalent overseas qualification) in a relevant science discipline.

### Careers

Many graduates have highly successful careers in environmental consultancy, health and safety management, food industry, public water utilities, waste management, and housing sector. One option is to develop a career as an Environmental Health Officer, where the variety and nature of work, salaries, working conditions, job security and fringe benefits compare very favourably with other graduate-level disciplines.

## Environmental Science

### MSc

This MSc is the only cross-disciplinary, science-based postgraduate course of its kind in Scotland, covering the fundamental scientific concepts of environmental science which will enable graduates to think and act holistically with regard to environmental and sustainability issues. The MSc has a strong scientific underpinning to environmental analysis, with practical and laboratory work in many classes. The course involves collaboration with industry and local and regional regulatory agencies.

### Curriculum

#### COMPULSORY MODULES

- > Air Pollution Control
- > Atmospheric Pollution Impact Assessment
- > Practical Environmental Chemistry
- > Principles of Environmental Microbiology
- > Principles of Environmental Chemistry
- > Research Protocols for Science and Engineering
- > Water and Environmental Management

plus one from:

- > Pollution & Rehabilitation of Degraded Ecosystems
- > Ecology, Biodiversity and Sustainability

#### OPTIONAL MODULES

(four to be chosen)

- > Climate Change Mitigation and Adaptation
- > Ecology, Biodiversity and Sustainability
- > Environmental Impact Assessment
- > Environmental Management Systems
- > Fundamentals of Environmental Forensics
- > Geographical Information Systems (GIS)
- > Pollution and Rehabilitation of Degraded Ecosystems

### Entry Requirements

First- or upper second-class Honours degree from a UK university (or equivalent overseas qualification) in earth, biological and physical sciences, engineering, mathematics, environmental management, or other relevant disciplines.

### Careers

There is a global demand for scientists trained in environmental science, and this course has been designed to produce such individuals. Graduates jobs include environmental scientists, sustainable development officers, environmental consultants and environmental regulation officers.

## Geotechnics

### MSc

This course is offered jointly by the Universities of Strathclyde and Glasgow and is run in partnership with a range of industrial partners, representing consultants, contractors and site investigation specialists. The academics contributing to the course are international experts in their field, supported by two Visiting Professors from industry. The course is sponsored by PLAXIS BV and by Wilde Analysis Ltd who provide the internationally known PLAXIS finite element code for geotechnical analyses. The innovative feature of the course is the integration of modern techniques for analysis, such as numerical modelling using PLAXIS.

The course acts as a geotechnical specialisation degree for civil engineering graduates as well as a conversion degree for earth sciences, physics and mathematics graduates wishing to develop skills for an exciting career in geotechnical engineering.

### Curriculum

Topics covered include:

- > Design of Shallow and Deep Foundations
- > Slopes and Walls
- > Foundation Engineering
- > Fundamentals of Soil Mechanics
- > Geo-environmental Engineering
- > Geotechnical Design Project
- > Rock Mechanics, Tunnelling and Groundwater
- > Site Investigation and Risk Assessment
- > Soil Modelling and Numerical Analysis
- > Contaminated Land
- > Ground Improvement & Reinforcement

Case studies and design projects are based on real projects, developed in collaboration with the industrial partners, and incorporate the recently introduced Eurocodes in geotechnical design. The industry partners also propose topics for industrially-relevant MSc projects.

### Entry Requirements

First- or upper second-class Honours degree from a UK university (or equivalent overseas qualification) in engineering, earth sciences, physics or mathematics.

### Careers

There is a huge skills shortage in the geotechnical industry world-wide and, despite the recent economic downturn, this need continues, given that about 50% of the Chartered Engineers in the field are expected to retire within 10 years. There is an increasing need to respond to the demands created by ageing infrastructure, sustainable transport infrastructure and the challenges created by climate change.

## Global Water Sustainability

MSc

This course is offered jointly by the University of Strathclyde and the University of Glasgow (awards are made in the name of both universities). The aim is to understand the nature of the freshwater crisis facing the planet and how this impacts on our lives in terms of pollution, water supply, water for energy, sanitation, wastewater, climate change and groundwater availability. The course explores the idea of 'water footprinting', in a similar manner to 'carbon footprinting', and is geared towards a combination of engineering problem-solving and environmental sustainability understanding, empowering engineers and scientists in a range of methods to analyse and design water schemes.

### Curriculum

#### COMPULSORY MODULES

- > Ecology, Biodiversity and Sustainability
- > Environmental Impact Assessment
- > Global Water Policy
- > Hydrogeology
- > Sustainable River Engineering Management
- > Water and Wastewater Treatment
- > Water Pollution

#### OPTIONAL MODULES

(five to be chosen)

- > Strategic Environmental Assessment in Action
- > Climate Change Mitigation and Adaptation
- > Coastal and Estuary Processes
- > Environmental Management Systems
- > Financial Engineering
- > Geographical Information Systems (GIS)
- > Research Protocols in Science and Engineering
- > Science, Technology and Innovation Policy
- > Water Resources in Africa – Case Study

### Entry Requirements

First- or second-class Honours degree from a UK university (or equivalent overseas qualification) in civil engineering, geography/earth sciences, environmental science or similar discipline.

Applications are to the University of Glasgow but students are registered for the MSc at both universities.

### Careers

There is a global demand for scientists and engineers trained in the water environmental area. With the background of the Millennium Development Goals and the International 'Water for Life' Decade (2005 to 2015), this MSc is of great interest to developing countries and the developed world alike.

## Hydrogeology

MSc

Hydrogeology is a key component of the water resources management required to meet the UN Millennium Development Goals and the 'Water for Life Decade', as well as meeting the targets required from the European Water Framework Directive. This MSc will prepare students as functional hydrogeologists to meet the needs of industry, regulators, government, and consultants throughout the world, to tackle the issues of water scarcity, water security, water economics and sanitation. It also involves linked research and projects in arid zone countries, such as Malawi, Mozambique, Tanzania and the Middle East.

### Curriculum

#### COMPULSORY MODULES

- > Aquifer Mechanics
- > Contaminated Land
- > Global Water Policy
- > Groundwater Flow Modelling
- > Hydrogeology
- > Practical Environmental Chemistry
- > Research Protocols for Science and Engineering
- > Site Investigation and Risk Assessment

#### OPTIONAL MODULES

(four to be chosen)

- > Ecology, Biodiversity and Sustainability
- > Environmental Impact Assessment
- > Environmental Modelling
- > Fundamentals of Environmental Forensics
- > Geographical Information Systems (GIS)
- > International Environmental Policy
- > Pollution and Rehabilitation of Degraded Ecosystems
- > Pollution Policy Control
- > Principles of Environmental Microbiology
- > Principles of Sustainability
- > Strategic Environmental Assessment in Action
- > UK and EU Environmental Law
- > Waste Management and Landfill Design

### Entry Requirements

First- or upper second-class Honours degree from a UK university (or equivalent overseas qualification) in earth sciences, civil engineering, environmental engineering or related disciplines.

### Careers

Graduates are in high demand and it is anticipated that the shortage of hydrogeologists in the UK and overseas will last for the next decade. In addition, issues of water scarcity, water security, water economics and health and sanitation throughout the world all rely on high quality hydrogeology knowledge.

# Sustainability and Environmental Studies

## MSc

This popular MSc, established in 1992, offers an innovative cross-disciplinary approach to the study of sustainability, environmental management, policy, technology innovation and development. It aims to develop an understanding of the theoretical perspectives associated with the decision tools used to apply sustainable development policy and management. This course is offered to students from all disciplinary backgrounds.

### Curriculum

#### COMPULSORY MODULES

- > International Environmental Policy
- > Principles of Sustainability
- > Qualitative and Quantitative Research Methods
- > Strategic Environmental Assessment in Action

#### OPTIONAL MODULES

(eight to be chosen)

- > Air Pollution Control
- > Atmospheric Pollution Impact Assessment
- > Ecology, Biodiversity and Sustainability
- > Energy Resources and Policy
- > Environmental Business Strategy
- > Environmental Impact Assessment
- > Environmental Management Systems

- > Environmental Modelling
- > Geographical Information Systems (GIS)
- > Learning for our Future: Sustainable Development Education
- > Pollution Control Policy
- > Pollution and Rehabilitation of Degraded Ecosystems
- > Principles of Environmental Microbiology
- > Recent Trends in Technological Progress
- > Science, Technology and Innovation Policy
- > Transport, Development and Sustainability
- > UK and EU Environmental Law
- > Waste Management and Landfill Design
- > Water and Environmental Management

### Entry Requirements

First- or upper second-class Honours degree from a UK university (or equivalent overseas qualification) in any discipline.

### Careers

There is a strong demand for graduates with environmental management and policy-making skills. This programme provides the opportunity to develop applied professional skills and knowledge and graduates are employed in a range of positions in private consultancies, government agencies, local authorities, businesses and industries.



### JANE MWENECHANYA

#### MSc Sustainability & Environmental Studies

Studying at the University of Strathclyde has been one of my best experiences. The environment is very conducive for learning and Glasgow itself has very friendly people who have made this place my second home.

I chose to study Environmental Studies because the course is interdisciplinary in nature. The many electives have enabled me to acquire diverse knowledge on environmental sustainability issues by combining both the scientific and social aspect in dealing with the environmental problems.

Coming from Malawi and being in a class of students with a wide range of backgrounds has allowed me to learn about how environmental problems are dealt with in different sectors.

Staff in the David Livingstone Centre of Sustainability are friendly, supportive, understanding and experienced. This has enabled me to gain knowledge and skills which will help me progress my career as an environmental scientist.

# Department of Design, Manufacture and Engineering Management

[www.strath.ac.uk/dmem](http://www.strath.ac.uk/dmem)

## RESEARCH DEGREES

MPhil, PhD

EngD Advanced Manufacturing: Forging & Forming

## TAUGHT COURSES

MSc

Global Innovation Management

MSc/PgDip/PgCert

Advanced Manufacture: Technology & Systems

Computer Aided Engineering Design

Digital Creativity

Mechatronics and Automation

Operations Management in Engineering

Product Engineering Design

Supply Chain and Operations Management/Logistics

Management/Procurement Management

Sustainable Product Development\*

\* part of Faculty Sustainable Engineering Programme, see pg 16

## CONTACT FOR TAUGHT COURSES

e: [pgadmissions@dmem.strath.ac.uk](mailto:pgadmissions@dmem.strath.ac.uk)



The Department of Design, Manufacture and Engineering Management (DMEM) conducts broad-based education and research of relevance to the needs of industry and commerce as well as public sector policy. Underpinning all the postgraduate teaching offered by the Department are active research projects funded by various UK research councils, EU programmes and UK government's Technology Strategy Board (DMEM has the highest number of Knowledge Transfer Partnership programmes in Scotland).

## RESEARCH

Our research mission is to bring together product design and development, manufacturing technology and engineering management research. This is a holistic and inclusive 'total engineering' approach to business and manufacturing which aims to provide solutions to a range of multidisciplinary global challenges by applying engineering thinking to those challenges.

The Department's research is integrated under the auspices of the Leonardo Centre for Creating, Making and Managing and is clustered into three main research themes as described below.

### DESIGN

This theme is concerned with design management and the application of computing technology to support design and design management. Research falls into several strands, including:

- > Intelligent CAD/CAM
- > Design Principles, Methods and Tools
- > Telepresence
- > Multimodal Design
- > Rapid Design and Manufacture
- > Collaborative Design and Product Development
- > Environmental Design
- > User-Lead Design
- > Design for X

### ADVANCED MANUFACTURING

This theme is focused on the research and development of experimental and numerical modelling techniques to improve the economic and technical performance of material forming technologies. The group is well known for the production of computer simulations verified through rigorous experimentation on the Department's unique metal-deformation equipment. The Department's capabilities in this area are dramatically enhanced by the purpose-built Advance Forming Research Centre which incorporates state-of-the-art laboratories and forming presses. This group is currently active in the following areas:

- > Net-shape Bulk Metal Forming
- > New Bulk-forming Processes and Techniques
- > Micro-forming Technologies
- > Design and Analysis of Forming Machinery
- > Manufacture of Cellular Bio-Materials via Sonication
- > Remanufacturing

### OPERATIONS MANAGEMENT

Projects under this theme are normally funded through the UK government, EU and industry with a view to creating and testing new technologies, management practices and concepts to improve the performance of organisations from a broad range of industry and commercial sectors.

Specific interests include:

- > Strategy and Performance Management
- > Process Excellence
- > Collaboration and Supply Chain Management
- > High Value Manufacturing
- > Design, Manufacture and Supply Chain Management for Renewable Energy Service Operations Management and Service Innovation

DMEM also hosts two interdisciplinary research institutes that integrate a number of disciplines across the University and beyond to deliver user-led research and development programmes. These institutes are:

**The Advanced Forming Research Centre (AFRC)** – a partnership between the University of Strathclyde and global industrial manufacturing companies. The AFRC conducts applied and fundamental research into forming and forging technologies. The current AFRC members range from major multinationals such as Boeing, Mettis Aerospace and Rolls-Royce, to specialist suppliers such as Bodycote, Mititoyo and Renishaw. The AFRC is housed within a purpose-built facility with dedicated staff and equipment close to Glasgow Airport. [www.strath.ac.uk/afrc](http://www.strath.ac.uk/afrc)

**Strathclyde Institute for Operations Management (SIOM)** – with a mission to provide thought leadership and facilitate the advancement of the theory and practice of operations management, SIOM brings together the leading experts in Operations Management from Strathclyde's Business School and Engineering Faculty to establish Operations Management as a strategic resource in the University. [www.strath.ac.uk/siom](http://www.strath.ac.uk/siom)

#### UNDERTAKING A RESEARCH DEGREE

We welcome research proposals related to our main research themes outlined above. We would particularly welcome proposals for interdisciplinary research which spans these themes.

#### CONTACT FOR RESEARCH DEGREES

Professor Umit Bititci, Director of Research  
**t:** +44 (0)141 548 2015  
**e:** [research@dmem.strath.ac.uk](mailto:research@dmem.strath.ac.uk)



## Advanced Manufacturing Industrial Doctorate Centre

### EngD Advanced Manufacturing: Forging & Forming

This new Engineering Doctorate is offered by the Advanced Manufacturing Industrial Doctorate Centre (AMIDC). The Centre, which focuses on developing new and enhanced manufacturing techniques within the forming sector is a joint collaboration between Strathclyde's Advanced Forming Research Centre (AFRC) and the Department of Design, Manufacture and Engineering Management. The AMIDC is the only established forging and forming research centre in the UK.

The EngD programme offers a unique opportunity to undertake world-leading research in manufacturing techniques, working with global industrial companies. It will enable students to develop their knowledge and abilities to understand manufacturing issues and allow them to gain industrial experience in order to communicate and implement viable engineering solutions. Unlike a traditional PhD, the EngD is focused on industry-based research, working at the AFRC or within the host company.

The four-year programme starts with a year of classes and projects, which provide a solid grounding in manufacturing and underpin the subsequent industry research project. The following three years are spent developing a research thesis while based within the sponsoring company.

### Industry Orientation (September)

Industrial and academic supervisors will offer advice on academic module options and provide direction for research thesis topics. This collaboration will continue with regular meetings throughout the programme.

### Year 1

#### SEMESTERS 1 & 2

Students complete the following compulsory modules and select six optional modules from the list below.

#### COMPULSORY MODULES

- > Manufacturing Automation
- > Micro- and Nano-Manufacturing
- > Strategic Technology Management
- > Advanced Material and Production Technology
- > Advanced Forming Technology and Systems
- > Research Methodology

#### OPTIONAL MODULES

- > Product Design Techniques
- > Strategic Supply Chain Management
- > CAED Systems
- > Project Management
- > Systems Integration
- > Information Management
- > Design of Experiments for Process Optimisation
- > Sustainable Product Design and Manufacturing
- > Fundamentals of Lean Six Sigma
- > Systems Thinking and Modelling

#### SEMESTER 3

- > Initial Scoping Project (to lead into main research thesis)
- > Industrial visits (as prelude to carrying out research in the industrial company)

**Years 2-4**

Potential research areas for EngD students based on the manufacturing challenges currently facing industry:

- > Higher quality material
- > More uniform parts and components
- > Understand the distribution of properties
- > Location of specific properties
- > Improved tooling
- > Higher precision final parts
- > Longer tool life/better lubricants
- > Improved process control
- > Press instrumentation
- > Equipment layout and process flow
- > Automation exploration
- > New techniques - Novel forming processes, net shape forming

**Entry Requirements**

A first or upper second-class Honours degree, or a Master's qualification in a science or engineering discipline.

**Funding**

Funding support may be available to EU and UK students to cover University fees and also provide an annual stipend of around £15k, tax free, for four years.

The programme will begin in October each year. EngD applicant interviews will be held between May and August. Applications are welcome throughout the year.

**CONTACT**

Christine Dent, AMIDC Programme Coordinator

t: +44 (0)141 534 5226

e: christine.dent@strath.ac.uk



## Advanced Manufacture: Technology and Systems

**MSc/PgDip/PgCert**

Manufacturing continues to be a core sector in a global context. This course is designed to provide high-calibre graduates with an in-depth understanding of advanced manufacturing technology and systems which they may not have acquired in their undergraduate programme. Graduates will be equipped with the technological skills required to meet organisational manufacturing challenges of implementing technology and systems for this century. This will include the manufacture of micro- and nano-technology products and the manufacture of components for a new generation of products across a range of industries, including automotive and aerospace.

**Curriculum****COMPULSORY MODULES**

- > Advanced Material and Production Technology
- > Micro- and Nano-Manufacturing
- > Advanced Forming Technology and Systems
- > Manufacturing Automation
- > Strategic Technology Management
- > Group Project
- > Master's Project

**OPTIONAL MODULES**

Students can select up to three from the following:

- > Information Management
- > Project Management
- > Design of Experiments for Process Optimisation
- > Sustainable Product Design and Manufacturing
- > Product Design Techniques
- > Fundamentals of Lean Six Sigma
- > Systems Thinking and Modelling
- > Strategic Supply Chain Management
- > CAED Systems
- > Systems Integration

**Course Duration**

MSc: 12 months full-time; PgDip: 9 months full-time

**Entry Requirements**

MSc: First- or second-class Honours degree, or equivalent, in any discipline.

PgDip: Degree, good HND and relevant industrial experience, may be considered for entry to the Postgraduate Diploma. Depending on satisfactory progress, students may transfer from the Diploma to the Master's course.



# Computer Aided Engineering Design

MSc/PgDip/PgCert

This course aims to produce a new generation of product design engineers who have the confidence to work with, develop and manage knowledge-based computer-aided engineering design systems (CAED) to support engineering design.

Students gain a thorough understanding of the methods, techniques and tools used in computer-supported product design and development, enabling you to make significant contributions to wealth generation by developing better products in a shorter time at a lower cost. These skills can be applied to and practised in industry-based design projects offered on the course.

The course will appeal to graduates with career interests in the application, development, research and management of CAED systems. This includes graduates and engineers from small- and medium-sized enterprises, consultancies, large manufacturing companies, college lecturers, and designers educated in an engineering or computer science discipline who wish to enhance their professional ability, enter computer-aided support for engineering design in engineering industries, or improve general IT skills.

## Curriculum

### COMPULSORY MODULES

- > CAED Systems
- > Design Management
- > Information Technology
- > Product Modelling and Visualisation
- > Systems Integration
- > Group Project
- > Master's Project

### OPTIONAL MODULES

Students also choose a selection from the following:

- > CAED Software Systems Design
- > Product Design Techniques
- > Knowledge Engineering and Management for Engineers
- > Modelling of Manufacturing and Business Systems
- > Design Methods
- > Project Management

## Course Duration

MSc: 12 months full-time; 24 months part-time  
PgDip: 9 months full-time; 21 months part-time

## Entry Requirements

MSc: First- or second-class Honours degree, or equivalent, in any discipline.

PgDip: Degree, good HND and relevant industrial experience, may be considered for entry to the Postgraduate Diploma. Depending on satisfactory progress, students may transfer from the Diploma to the Master's course.

# Digital Creativity

MSc/PgDip/PgCert

Digital Creativity has become paramount in our society, influencing all aspects of our life, all industrial sectors and all types of design including industrial, interior, product and graphical.

This course is aimed at developing high-calibre Master's graduates with the skills and knowledge to utilise new digital technologies in the creative process. The course would appeal to a wide range of disciplines including architecture, arts, computer science, design, media and engineering.

## Course Structure

The course structure and content are based on the digital society needs of the 21st century's creative organisations. Core elements focus on the digital medium for supporting creativity. Optional classes allow you to customise the course to suit your particular career aspirations. Throughout the course, there is an emphasis on integration, enhanced by group assignments, team projects and industrial visits.

## Curriculum

### COMPULSORY MODULES

- > Digital Media
- > Information Management
- > Product Modelling and Visualisation
- > Virtual Reality and Rapid Prototyping

### OPTIONAL MODULES

Students also choose a selection from the following:

- > Building Information Modelling
- > CAED Software Systems Design
- > CAED Systems
- > Design Methodology
- > Generative Design
- > Knowledge Management
- > People, Organisation and Technology
- > Virtual World for Design
- > Project Work and Project Management

## Course Duration

MSc: 12 months full-time; 24 months part-time  
PgDip: 9 months full-time; 21 months part-time

## Entry Requirements

MSc: First- or second-class Honours degree, or equivalent, in a relevant discipline.

PgDip: Degree or good HND and relevant industrial experience, may be considered for entry to the Postgraduate Diploma.

Depending on satisfactory progress, students may transfer from the Diploma to the Master's course.

## Careers

Graduates may expect careers in a wide variety of sectors and disciplines including advertising, animation, architectural design, computer graphics, design, film, industrial design, marketing, media, multimedia development, virtual reality, and web development.

# Global Innovation Management    Mechatronics & Automation

## MSc (Jointly Awarded)

The University of Strathclyde, Aalborg University (Denmark), Hamburg University of Technology (Germany) and Swinburne University (Australia) developed this programme to provide students with a broad, truly global perspective of Innovation Management. The programme is delivered in English at the institutions.

The course concentrates on cross-functional and global cooperation within the front end of the innovation process, managing innovation projects and preparing the market introduction of new products and services. The internship provides global innovation management work experience during which students deliver a project to the host Danish company.

### Curriculum

The common first year at Strathclyde includes practical experience of working within globally distributed teams and with an industrial client on product/service development briefs. The first semester of the second year is spent undertaking one of the following:

- > more in-depth study of innovation management in Germany
- > study of innovative entrepreneurship in Australia
- > industrial internship in Denmark

In the final semester all students undertake a thesis project, supervised by the second-year host institution.

### Curriculum

#### COMPULSORY CLASSES

- > Innovation Management
- > Global Design
- > Product Development Project
- > Design Management
- > Design Methods
- > Strategic Technology Management
- > People, Organisation and Technology
- > Supply Chain Operations

#### OPTIONAL MODULES

(three can be chosen)

- > Management of Total Quality and Continuous Improvement
- > Engineering Risk Management
- > Enterprise Resource Planning
- > Strategic Supply Chain Management
- > Financial Management In Supply Chains
- > Sustainable Product Design and Manufacture
- > Product Design Techniques
- > Design for Manufacture and Assembly
- > Systems Thinking and Modelling
- > Information Management
- > Knowledge Engineering and Management for Engineers

### Course Duration

24 months full-time

### Entry Requirements

Second-class Honours degree, or equivalent, in an engineering, science or technology subject.

### Careers

Graduates may expect to pursue careers as innovation managers, strategic planners, product/programme/design managers, project leaders, and in management consultancy.

## MSc/PgDip/PgCert

Mechatronics & Automation is becoming an increasingly important discipline in today's digital society. New intelligent products have been designed applying mechatronic principles to the increasing benefit of consumers and society. This course has been designed to provide high-calibre graduates with a broad introduction to the issues encountered and techniques required in developing these advanced mechatronic products and automation systems. The course also addresses the challenge of providing industry with generalists who can use broad knowledge and skills to develop multidisciplinary products with a holistic and integrated approach.

Graduates will have both theoretical understanding and practical application of mechatronic design principles and best practice. The course also provides an in-depth understanding of, and a professional insight into, a modern product development process and project management.

### Curriculum

#### COMPULSORY MODULES

- > Manufacturing Automation
- > Product Design Techniques
- > Product Modelling and Visualisation
- > Advanced Project Management
- > Group Project
- > Master's Project

#### OPTIONAL MODULES

Students also choose a selection from the following:

- > Knowledge Engineering and Management for Engineers
- > Systems Integration
- > CAED Software Systems Design
- > Design Methods
- > Information Technology
- > Control of Principles
- > Control Techniques

### Course Duration

MSc: 12 months full-time; 24 months part-time

PgDip: 9 months full-time; 21 months part-time

### Entry Requirements

MSc: First- or second-class Honours degree, or equivalent, in any discipline.

PgDip: Degree, good HND and relevant industrial experience, may be considered for entry to the Postgraduate Diploma. Depending on satisfactory progress, students may transfer from the Diploma to the Master's course.

# Operations Management in Engineering

## MSc/PgDip/PgCert

Business performance depends on efficient and effective operations throughout the company through work at operational, tactical to strategic levels and from market need through to customer delivery and service. This course is aimed at graduates wishing to broaden their expertise, eg from a technological first degree, or who wish to work within the engineering industry.

On completion, they will be equipped with state-of-the-art concepts, methods, techniques and tools enabling them to analyse and implement solutions to operations management issues in an engineering environment.

### Curriculum

#### COMPULSORY MODULES

- > Environmental Impact and Sustainability
- > Management of Total Quality and Continuous Improvement
- > People, Organisation and Technology
- > Engineering Risk Management
- > Strategic Technology Management
- > Advanced Project Management
- > Group Project
- > Master's Project

#### OPTIONAL MODULE

Students also choose one from the following:

- > Facilities Management
- > Supply Chain Operations
- > Systems Thinking and Modelling

#### GROUP PROJECT

Teams of students tackle problems of practical relevance in cooperation with external personnel, participating in field trips and producing regular progress reports. Successful completion of eight instructional modules and a group project leads to the award of a Postgraduate Diploma.

#### INDIVIDUAL PROJECT

Each student undertakes an individual project assignment in which a selected topic is studied in depth, involving a comprehensive literature review, defining realistic objectives, devising a method of approach, systematically carrying out the work and preparing a thesis. Successful completion of eight modules, a group project and individual project leads to the award of an MSc.

### Course Duration

MSc: 12 months full-time; 24 months part-time  
PgDip: 9 months full-time; 21 months part-time

### Entry Requirements

MSc: First- or second-class Honours degree, or equivalent, in engineering, technology, business or a similar discipline. Industrial experience is valued and exemptions based on work experience or other similar courses may be possible.

PgDip: Degree or good HND and relevant industrial experience may be considered for entry to the Postgraduate Diploma. Depending on satisfactory progress, students may transfer from the Diploma to the Master's course.

# Product Engineering Design

## MSc/PgDip/PgCert

The course has been designed to provide a physical product-focused engineering design postgraduate qualification. It aims to address the issues associated with a rapidly-changing market and the demands for better, cheaper and personalised products developed within the shortest possible time. The course will provide a thorough training in design theories and process models, design methods, design techniques, computer supported product modelling, analysis, evaluation and digital and physical rapid prototyping of a design solution. Students will be equipped with the skills, knowledge and understanding to develop exciting products for the future. The course enhances the professional and creative abilities of graduates from a variety of 'design-centred' disciplines, from mechanical, mechatronic and electrical functions to IT.

### Curriculum

#### COMPULSORY MODULES

- > CAED Systems
- > Product Modelling and Visualisation
- > Product Design Techniques
- > Design Management
- > Group Project
- > Master's Project

#### OPTIONAL MODULES

Students also choose a selection from the following:

- > Information Management
- > Project Management
- > Risk Management
- > Systems Integration
- > Knowledge Engineering and Management for Engineers
- > Design Methods
- > Sustainable Product Development

### Course Duration

MSc: 12 months full-time; 24 months part-time  
PgDip: 9 months full-time; 21 months part-time

### Entry Requirements

MSc: First- or second-class Honours degree, or equivalent, in a relevant engineering, technology or science discipline.

PgDip: Degree, good HND and relevant industrial experience, may be considered for entry to the Postgraduate Diploma. Depending on satisfactory progress, students may transfer from the Diploma to the Master's course.

# Supply Chain and Operations Management/ Logistics Management/ Procurement Management

MSc/PgDip/PgCert

Supply Chain Management encompasses everything from initial design to procurement of material and services, processing and delivery to the customer. In addition to providing high-calibre graduates with an in-depth understanding of strategic, tactical and operational issues relating to management of supply chains, the programme provides an additional opportunity for students to select a specialism in Operations Management, Logistics Management or Procurement Management.

On completion of the course, you will be equipped with state-of-the-art concepts, methods, techniques and tools to allow you to contribute towards the competitiveness of industrial and commercial organisations worldwide. The programme is delivered in collaboration with the Chartered Institute for Procurement and Supply.

## Curriculum

### CORE MODULES

- > Business, Operations and Supply Chain Strategy
- > Strategic Supply Chain Management
- > Supply Chain Operations
- > Management of Total Quality and Continuous Improvement
- > Enterprise Resource Planning
- > Advanced Project Management
- > Product Costing and Financial Management
- > Case Studies in Supply Chain Management
- > Master's Project

### SPECIALIST MODULES

Students also choose from the following options, according to their specialist theme:

### OPERATIONS MANAGEMENT

- > Fundamentals of Lean Six Sigma
- > Service Operations Management
- >

### LOGISTICS MANAGEMENT

- > Logistics
- > Logistics Network Optimisation and Simulation

### PROCUREMENT MANAGEMENT

- > Strategic Procurement Management
- > Organisational Buying Behaviour and Structures

## Course Duration

MSc: 12 months full-time; 24 months part-time

PgDip: 9 months full-time; 21 months part-time

## Entry Requirements

MSc: First- or second-class Honours degree, or equivalent, in any discipline.

PgDip: Degree, good HND and relevant industrial experience, may be considered for entry to the Postgraduate Diploma. Depending on satisfactory progress, students may transfer from the Diploma to the Master's course.

## Careers

The knowledge and skills you will gain through the course will make you a valuable resource in any supply chain-based enterprise – where you can contribute immediately – and make a difference!

## MS CHETHAN

### MSc Supply Chain & Operations Management

I chose to study at Strathclyde as it is one of only a few universities in the UK with a course accredited by the Chartered Institute for Procurement & Supply and I felt that this would be the best possible place to get this qualification. The SCOM course is a tailor-made programme for a graduate like me and it provides everything you need to know to enter into the supply chain industry. Its graduates set really high standards in the job market and I believe that this degree will give me the perfect kick-start to my supply chain career. Staff in the Department are knowledgeable and helpful and they have been supportive, not only academically but also in my personal development process.



# Department of Electronic & Electrical Engineering

[www.strath.ac.uk/eee](http://www.strath.ac.uk/eee)

## RESEARCH DEGREES

MPhil, PhD, EngD

## TAUGHT COURSES

MSc

**Communications, Control & Digital Signal Processing**  
**Communications Technology & Policy**  
**Digital Multimedia & Communication Systems**  
**Electrical Power Engineering with Business**  
**Electronic & Electrical Engineering**

## CONTACT

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GSE Power Station Simulator

The Department has an international reputation for teaching and research excellence across the broad spectrum of electronic and electrical engineering. Considered one of the premier departments of our kind, our expertise spans electrical power engineering & renewable energy, telecommunications & signal processing, ultrasonics, microsystems, photonics, and control systems.

Research activities are driven by six strategically focused groups, which reflect the Department's scale, diversity and vision, and underpin its teaching programmes. The latest UK Government Research Assessment Exercise (RAE) affirmed our status for "world-leading and internationally excellent" research, rating us top in Scotland – by a long way – and 3rd in the UK.

### A Major Innovator

Research-led, we are recognised for innovation in electronic & electrical engineering education and are home to several unique and internationally-leading facilities. These include Europe's first research centre dedicated to the development of 'smart' technologies, Europe's only GSE Power Station Control Room Simulator, and the UK's only Wind Energy Systems Doctoral Training Centre.

Our strong partnerships with government, industry and a variety of global research agencies have resulted in a large scholarship programme, an outstanding record of entrepreneurship and the commercial adoption of our research results and innovations across key industrial sectors. Company successes include Diagnostic Monitoring Systems and SmarterGridSolutions.

### An International Perspective

We operate substantial and well-established collaborations with academic and industrial partners in Europe, the Americas, Indian Sub-Continent and SE Asia. With over 230 students from 40 nations, we have a vibrant international Graduate School. Students are the heart of our vision and all of our activities focus on supporting them to fulfil their potential to become the engineers of the future who shape and inform society. Teaching led by world-class scholars combined with pioneering research and state-of-the-art facilities ensures the School achieves this – delivering a modern and globally relevant education in a friendly and supportive environment.

## SMART TECHNOLOGIES AND GLOBAL RENEWABLE ENERGY RESEARCH

The development and use of renewable energy is essential for the delivery of international low carbon economies and to secure electricity supplies. Glasgow is at the heart of the wind, wave and tidal energy boom with major multinational organisations locating here to design, develop and manufacture their renewable energy technologies. The Institute for Energy and Environment is at the forefront of this technology revolution. Our research in wind energy technologies, smart grids, electric vehicles and smart household appliances is leading innovation in the sector and with our global engineering partners we are delivering the technologies, products and services of the future. Our new industry and government supported Power Network Demonstration Centre, where the next generation of smart grid and renewable energy technologies will be tested, is just one of our unique facilities playing a key role in the development of the renewable energy sector.

## Research Groups

### Centre for Excellence in Signal and Image Processing

– is internationally recognised for its activities in Signal and Image Processing algorithms, architectures and applications. The Centre conducts world-class research in areas of critical importance to the growth and success of the Information and Communications Age. It has six areas of expertise covering concept development and strategic issues to applications in key industrial sectors.

Research opportunities exist within each of these areas:

- > Novel Algorithms for Signal and Image Processing
- > Multimedia Systems and Image Processing
- > Biomedical and Genomic Signal Processing
- > MIMO Radar and Communications Systems
- > Hyperspectral Imaging
- > RF Signals and Systems

The Centre is home to the Texas Instruments Chair of Signal Processing, the first awarded to any University outside America and host to the China-Scotland Signal Image Processing Research Academy.

Research opportunities include: Information Forensics and Security; Novel FPGA and DSP Architectures and Technologies; Defence, MIMO Communications and Radar Systems; Biologically Inspired Signal/Image Processing; Secure Audio and Video Services; Integrity of Data Transmission and Storage; Distributed Video Coding, 3D TV and Digital Holographic Methods; Human Genome-Boolean Models.

### Centre for Intelligent Dynamic Communications

– is a centre of excellence focusing on communications technologies and is active in determining applications of optical/wireless techniques in future network evolutions. The Centre's research profile, comprising four specialist groups, is underpinned by substantial industrial and research council funding:

- > Mobile Communications
- > Broadband and Optical Networks
- > DSP Enabled Communications
- > Plastic Electronics

Although exploring core themes of communications devices, networking and mobility, activities within these groups overlap to cover the full spectrum of intelligent dynamic communications and offer an extensive portfolio of research opportunities.

The Centre is home of the world's first Xilinx chair in Digital Signal Processing and is a key contributor in the UK's Virtual Centre of Excellence in Mobile and Personal Communications (Mobile VCE).

### Centre for Microsystems and Photonics

– specialises in photonic sensors and systems, active & passive photonic devices, control of solid-state lasers, MEMS, microfluidics, microsensors and free-space microphotonics.

The Centre has been internationally active for over 25 years, and has an extensive portfolio of theoretical and applied research, supported by industrial partnerships and collaboration with research organisations. It has four distinct thematic activities, and research opportunities exist within each of these:

- > Photonic Sensors and Systems
- > MEMS and Microsensors
- > Microfluidics
- > Advanced Laser Systems

Opportunities include: Modelling and Engineering of Lasers; Optical MEMS and Systems Applications; Biomedical Sensing using Optical Waveguides; Optical Gas Sensing; Lab-on-a-Chip for Biomedical Research; Laser Generated Ultrasound for Materials Testing.



### Centre for Ultrasonic Engineering

– is a founding partner in the UK Research Centre for Non-Destructive Evaluation (RCNDE), and is internationally recognised in the field of ultrasonic transducers and transducer systems. Globally unique, with unparalleled facilities and expertise, the Centre is well placed to meet the demands of future ultrasonic technology development. Its activities address markets in underwater sonar, biomedical imaging and therapy, non-destructive testing and industrial process ultrasound, with expertise spanning eight technical themes. Research opportunities exist within each of these:

- > Non-Destructive Evaluation
- > Animal Ultrasound
- > Transducers
- > Industrial Process Control
- > Modelling and Advanced Software
- > Sonar
- > Biomedicine
- > Materials Science for Ultrasonic Applications

The Centre participates in extensive national and international collaborative research projects such as BIAS and RCNDE, and recently established the UK's first technology transfer laboratory dedicated to NDE research – Facility for Innovation and Research into Structural Testing (FIRST) and the Centre of Excellence in Coded Ultrasound in partnership with the Universities of Virginia and Southern California.

### Industrial Control Centre

– Internationally recognised for its theoretical and applied control engineering research, the Centre spans key industrial sectors including Metals and Manufacturing, Automotive and Marine, Water, Environment and Power, Renewable Energy, Wind Energy Systems, Aerospace and Defence, Systems Biology and Medical Robotics. The primary focus of its research is on the development of system engineering methods and practical algorithms for the control and optimisation of complex and nonlinear systems.

Being at the forefront of its discipline, the Centre offers considerable opportunities for research in: Performance Assessment and Benchmarking of Control Systems; Non-linear Systems Advanced Control; Stochastic Systems: Embedded and Real-time Systems; Adaptive Control Tuning and Neural Networks.

### Institute for Energy and Environment

– is among Europe's leading electrical power engineering and energy technology University groups, with its research activities internationally recognised for their "scientific excellence and industrial relevance". The Institute's extensive research portfolio is underpinned by four core areas of expertise:

- > Advanced Electrical Systems & Power Systems
- > High Voltage Technology and Electrical Plant Diagnostics
- > Renewable Energy Technology
- > Power Electronics, Drives and Energy Conversion

Strategically-focused research in each of these is concentrated within world class centres of excellence, closely matched to industry and government needs. These centres include:

- > Rolls-Royce University Technology Centre in Electrical Power Systems
- > ScottishPower Advanced Research Centre
- > Scottish and Southern Energy Research Partnership
- > Wind Energy Systems Doctoral Training Centre
- > EDF Energy Advanced Diagnostics Centre
- > Robertson Trust Laboratory for Electronic Sterilisation Technologies
- > GSE Systems Power Station Control Room Simulator

Examples of research opportunities include: Distributed Generation Systems and Technologies; Smart Grids; Offshore Wind Energy; Electronic Pasteurisation and Sterilisation Technologies; Condition Monitoring; Energy Management; Power Systems Protection, Control and Analysis; Active Network Management; Pulsed Power; Energy Scavenging; Power Electronics and HVDC; and, Intelligent Systems and Artificial Intelligence.

The Institute offers an EPSRC four-year EngD programme in Nuclear Engineering, combining technical and management training, with industry-based research.

### RESEARCH DEGREES

We welcome proposals for research degrees all year round.

### CONTACT FOR RESEARCH DEGREES

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## HUANG SIKAI

EEE PhD

I joined the Department as an undergraduate on its Joint Education Programme from Shanghai University of Electric Power, China. After graduating, I progressed to my PhD, which investigates the potential contribution of domestic electric vehicles to Power Distribution System Operation. The Department is a friendly and encouraging research environment, allowing me to not only collaborate with academic staff and researchers from the same area, but also from different disciplines. As a PhD student, it is important to have this opportunity in order to develop a broad knowledge of all aspects of my research topic.



## EPSRC Wind Energy Systems Doctoral Training Centre

[www.strath.ac.uk/windenergy](http://www.strath.ac.uk/windenergy)

The Doctoral Training Centre (DTC) was established to help develop the UK's global position in the wind energy field and create the leaders of tomorrow. It brings together pioneering research and advanced skills training to help the UK meet its ambitious renewable energy targets, and address the widely accepted skills shortage in this rapidly expanding sector.

Drawing on expertise from across the University, the Centre involves world-class academics from a wide variety of disciplines. It is housed within custom-built research facilities within the Department's internationally recognised Institute for Energy and Environment, a leading academic centre for electrical power engineering and energy expertise. Supported by over 30 key UK and global business and industry partners, the Centre is committed to developing the new wave of highly skilled professionals needed to meet the energy challenge.

Ten prestigious four-year PhD studentships are on offer for entry in 2012. You will receive a formal programme of training and research to develop and enhance your technical interdisciplinary knowledge, and broaden your understanding of the social, political and economic contexts of wind power.

Year 1 comprises formal classes in all aspects of wind technology, together with training in professional, business and entrepreneurial skills, and research techniques and methodologies. Potential PhD topics are explored during this year, with your final topic agreed for the start of Year 2.

### Year 1

#### SEMESTER 1 (OCT – JAN)

- > Group Project
- > Socio-Economics of Energy Systems
- > Mechanical Systems and Turbine Design
- > Wind Turbine Technology 1
- > Power Systems and Wind Integration 1
- > Weekly lectures by Industry and Academic experts

#### SEMESTER 2 (JAN – MAY)

- > Wind Turbine Control
- > Wind Turbine Power Conversion
- > Wind Turbine Technology 2
- > Power Systems and Wind Integration 2
- > Weekly lectures by Industry and Academic experts

#### RESEARCH TRAINING & DEVELOPMENT (JUNE-OCT)

- > 2 mini-projects
- > Industrial visits
- > Attendance at EWEA Wind Academy

### Years 2-4

You undertake a PhD project on a topic of your choice within the wind energy discipline. Project areas include: Medium/Large Machine Design; Reliability; Off-Shore Location; Wind Farm Design; Wind Power Integration; Socio-Economics: Small Machine and Stand Alone Systems, and Demand Side Management.

### Entry Requirements

Studentships are available to UK and eligible EU citizens who have, or are about to obtain, a first-class Honours or MSc degree in a physical science or engineering discipline.

Studentships begin on 1 October each year, cover University fees and offer a highly competitive maintenance grant for all four years. Applications open annually from 1 October, with interviews conducted between March and June.

### CONTACT

Academic Enquiries

Professor Bill Leithead

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Admissions Enquiries

Drew Smith, Administrator

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e: [drew.smith@eee.strath.ac.uk](mailto:drew.smith@eee.strath.ac.uk)





## TAUGHT COURSES

We offer five specialist taught postgraduate degrees aligned with our key research strengths. All are fully accredited by the Institution of Engineering and Technology (IET), enabling you to fast-track your way to invaluable professional recognition.

Courses are taught by a blend of lectures, tutorials and practical laboratories. Advanced technical engineering expertise is developed in parallel with communication, project management and leadership skills, all of which are vital for your future career. Assessment techniques include written assignments, exams and practical team-based and individual projects.

You have access to our extensive computing network, and purpose built teaching spaces equipped with the latest technologies. Interaction with Industry is provided through teaching seminars and networking events, and we deliver weekly seminars to support your learning and career development. Course tutors are available to address individual concerns.



### OTE AMUTA

#### MSc Communications, Control & Digital Signal Processing

Studying in one of UK's top departments of Electronic & Electrical Engineering is a dream come true for me especially because of the opportunity to interact with and learn from the very best in my chosen field. My course is a cutting-edge combination that will prepare me for the challenges of modern-day technological development.

The University provides the much-needed conducive environment and modern, multimedia learning/teaching facilities, with friendly, supportive and knowledgeable staff. The library stands out in terms of facilities – there is a vast range of international journals and its infrastructure is excellent.

Glasgow is unique – it's the greenest city I've ever seen. It's really friendly and with its international student population, I've been able to relate to and learn from people from different cultures and ideas making my Strathclyde experience into a global experience.

## Communications, Control & Digital Signal Processing

### MSc

This full-time course covers the theoretical and practical aspects of communications theory and networks, fundamental control technology and digital signal processing (DSP).

Encompassing topics critical to the information and communications age, you will gain an advanced knowledge of the principles of the communications, control and DSP domains and an understanding of the current and future developments and technologies within these three disciplines. This will enable you to capitalise on job opportunities within a diverse range of sectors including control, telecommunications, signal processing, manufacturing, electronics and IT user companies. Our graduates have secured well-paid positions within companies such as EDF Energy, Siemens and Texas Instruments.

### Curriculum

Two semesters of formal teaching comprising core and elective technical modules are followed by a three-month practical, industry-relevant project.

#### CORE MODULES

- > Digital Signal Processing Principles
- > Information Transmission & Security
- > Control Principles
- > Assignment & Professional Studies

#### ELECTIVE MODULES

(two to be chosen)

- > Communications Networks
- > Advanced DSP
- > Embedded Systems Design
- > Image & Video Processing
- > Control Techniques
- > Mobile & Wireless Networks

#### PROJECT

MSc students undertake a project within their chosen research specialisation. It may be possible for this to be carried out with one of our industrial or academic partners.

#### Course Duration

12 months, full-time

#### Entry Requirements

A first or good second-class Honours degree or equivalent overseas qualification in electronic, electrical or communications engineering, or a related subject from a recognised academic institution.

## Communications Technology & Policy

### MSc

Influences of users, providers, regulators and standardisation bodies has led to varied provision of modern global communications systems ranging from highly-regulated, single provider networks to the dynamic application-based Internet, and from high-speed infrastructure core networks to heterogeneous wireless access networks.

To be an effective communications engineer requires not only a good knowledge of the underpinning technologies, and user and application requirements, but a firm understanding of the business and regulatory landscape that multinational communication networks must work within. This course is an advanced multidisciplinary programme that brings together expertise in communications networks and systems with public policy and regulatory structures within an international perspective. Communications systems theory, modern information processing concepts and architectures, regulatory policy and market structures are examined to allow graduates to gain the skills and expertise to become managers, strategists and leaders in the internationally evolving IT and communications industry.

### Curriculum

Two semesters of formal teaching comprising core and elective technical modules are followed by a three-month practical, industry-relevant project.

#### CORE MODULES

- > Communications Networks
- > Mobile & Wireless Networks
- > Regulation & Competition in Network Industries
- > Assignment & Professional Studies

#### ELECTIVE MODULES

(up to three to be chosen)

- > Topics in Communications Management
- > Information Transmission & Security
- > Software Engineering
- > Communications Environment
- > The Principles & Practice of Communications Policy



#### PROJECT

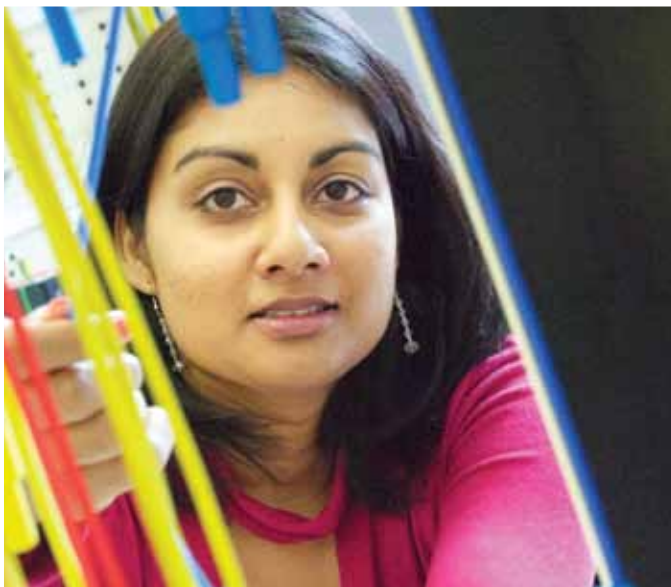
MSc students undertake a project within their chosen research specialisation. It may be possible for this to be carried out with one of our industrial or academic partners

#### Course Duration

12 months, full-time

#### Entry Requirements

A first or good second-class Honours degree or equivalent overseas qualification in electronic, electrical or communications engineering, or a related subject from a recognised academic institution.



### TRICIA RAGOOBAR

#### MSc Communications, Technology & Policy

Prior to studying for my MSc, I lectured at the University of the West Indies in the Department of Electrical and Computer Engineering. When the course material for its undergraduate and graduate programmes required revision, the knowledge and experience gained from my MSc was key in enabling me to perform this, share lessons from a developed country and thus, contribute to the development of telecommunications within my own country. My MSc ultimately guided my future career, as I have come back to Strathclyde to do my PhD in Management. That I returned here from a Caribbean island should say it all!

## Digital Multimedia & Communication Systems

### MSc

This full-time course recognises the need for graduates skilled in the new multimedia technologies which are revolutionising the way we live and work. You will be able to analyse, design, deploy and maintain digital multimedia information systems and networks, playing a key role in the rapidly evolving digital multimedia communications industry.

The course brings together multimedia concepts and standards, wireless and fixed broadband communication systems and protocols, multimedia programming concepts, Internet and web applications, and programming paradigms. These foundations are unified through system design issues within taught classes, case study assignments and project work.

The potential applications of, and career opportunities within multimedia and communications are widespread, spanning business, commerce, education, health and entertainment. Several major organisations target the Department for recruitment purposes and our graduates have had considerable success in the job market, gaining positions such as Operations Director of Motorola and being a founding Director of Nallatech Ltd.

### Curriculum

Two semesters of formal teaching comprising core and elective technical modules are followed by a three-month practical, industry-relevant project.

#### CORE MODULES

- > Digital Signal Processing Principles
- > Embedded Systems Design
- > Image & Video Processing
- > Advanced DSP
- > Assignment & Professional Studies

#### ELECTIVE MODULES

(one to be chosen)

- > Information Transmission & Security
- > Communications Networks
- > Mobile & Wireless Networks

#### PROJECT

MSc students undertake a project within their chosen research specialisation. It may be possible for this to be carried out with one of our industrial or academic partners.

### Course Duration

12 months, full-time

### Entry Requirements

A first or good second-class Honours degree or equivalent overseas qualification in electronic, electrical or communications engineering, or a related subject from a recognised academic institution.

## Electrical Power Engineering with Business

### MSc

This full-time course recognises the need for graduates skilled to address the world's major issues in electrical energy and power systems. It offers an integrated programme targeted at graduates concerned with the design, operation and analysis of power supply systems, power plant, renewables and industrial electrical equipment in the context of a liberalised power supply industry, globalised markets and environmental drivers.

The course provides the advanced level of knowledge and understanding required for challenging, well paid and exciting careers in the dynamic and high growth electrical power and renewable energy sectors. Employment prospects are excellent, with recent graduates operating in power engineering consultancy, global power utilities (generation, supply and distribution), the renewable energy sector and manufacturing.

### Curriculum

Two semesters of formal teaching comprising core and elective technical modules are followed by a three-month practical, industry-relevant project.

#### CORE MODULES

- > Advanced Power System Analysis & Protection
- > High Voltage Technology & Electromagnetic Compatibility
- > Power Electronics for Energy & Drive Control
- > Assignment & Professional Studies

#### ELECTIVE MODULES

(two to be chosen)

- > Power System Economics, Markets & Asset Management
- > Wind Energy & Distributed Energy Resources
- > Wind Power Control & Operation
- > Software Engineering
- > Regulation & Competition in Network Industries

#### PROJECT

MSc students undertake a project within their chosen research specialisation in the power and energy domain. It may be possible for this to be carried out with one of our industrial or academic partners.

### Course Duration

12 months, full-time

### Entry Requirements

A first or good second-class Honours degree or equivalent overseas qualification in electronic or electrical engineering, or a related subject from a recognised academic institution.

# Electronic & Electrical Engineering

## MSc

This full-time course is specifically designed for students who wish to pursue advanced studies across the broad range of subjects relevant to electronic and electrical engineering. You select modules from the extensive range of postgraduate taught courses delivered by the Department. This unique flexible structure allows you to construct a personalised MSc programme that meets your academic interests and career aspirations. The interdisciplinary nature of the course offers a wide range of career opportunities. Recent graduates have gained well paid positions in the electrical supply industries, telecommunications and IT, consulting and design companies, healthcare and aerospace with organisations such as Mott MacDonald, Siemens, Nokia and JP Morgan.

### Curriculum

#### CORE MODULE

- > Assignment & Professional Studies

#### ELECTIVE MODULES

(five to be chosen)

- > Power Electronics, Machines & Applications
- > Power System Design, Operation & Protection
- > Digital Signal Processing Principles
- > Information Transmission & Security
- > Communications Networks
- > Control Principles
- > Advanced Power System Analysis & Protection
- > High Voltage Technology & Electromagnetic Compatibility

- > Power Electronics for Energy & Drive Control
- > Power System Economics, Markets & Asset Management
- > Wind Energy & Distributed Energy Resources
- > Advanced DSP
- > Embedded System Design
- > Image & Video Processing
- > Control Techniques
- > Mobile & Wireless Networks
- > Wind Power Control & Operation
- > Software Engineering

#### PROJECT

MSc students undertake a project within their chosen research specialisation. It may be possible for this to be carried out with one of our industrial or academic partners.

#### Course Duration

12 months, full-time

#### Entry Requirements

A first or good second-class Honours degree or equivalent overseas qualification in electronic or electrical engineering or a related subject from a recognised academic institution.



## Scholarship Programme

International MSc applicants are eligible to apply for a range of scholarships offered by the University:

- > **Commonwealth Shared Scholarship**
- > **University of Strathclyde International Scholarships**
- > **Palestinian Scholarship Scheme**
- > **Saltire Foundation**
- > **Pakistan 50th Anniversary Fund**

The Department also offers a large number of scholarships across all of its MSc courses to attract the very best International and UK students:

- > **International Excellence Awards** – bursaries up to £3,000
- > **International Scholarships for Russia** – awards up to £3,000 for top quality students from the Russian Federation
- > **Student Awards Agency for Scotland** – open to well qualified UK and EU students only. Tuition fees are paid in full.
- > **Fundacion Iberdrola** – scholarships focus on the field of energy and environment, and are open to UK and Spanish nationals only. Tuition fees are paid and a generous monthly stipend given.

#### CONTACT

Elaine Black

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Visit [www.strath.ac.uk/eee/scholarshipsandfunding/](http://www.strath.ac.uk/eee/scholarshipsandfunding/) for further details.

# Department of Mechanical & Aerospace Engineering

[www.strath.ac.uk/mecheng](http://www.strath.ac.uk/mecheng)

## RESEARCH DEGREES

MPhil, PhD

## TAUGHT COURSES

MSc/PgDip/PgCert

**Advanced Mechanical Engineering**

**Power Plant Engineering**

**Power Plant Technologies**

**Renewable Energy Systems and the Environment\***

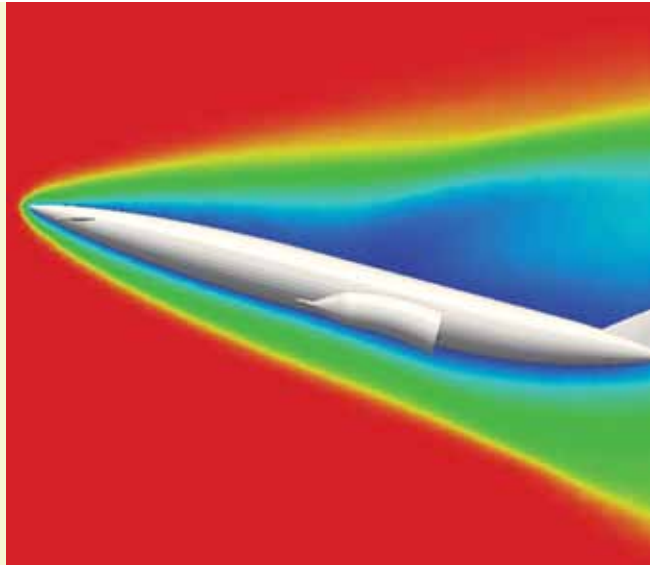
\* part of Faculty Sustainable Engineering Programme, see pg 16

## CONTACT

Christina Rossi

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e: [christina.rossi@strath.ac.uk](mailto:christina.rossi@strath.ac.uk)



The Department's leading-edge research spans a variety of length scales from understanding the behaviour of nano-fluids for future medical devices to designing large ocean power systems for renewable energy supply. Our industrial collaborations encompass a wide range of key engineering sectors including energy, aerospace, transportation and health.

The Department hosts the Energy Systems Research Unit (ESRU), incorporating the Building Research Establishment Trust Centre of Excellence in Energy Utilisation, the Advanced Space Concepts Laboratory, the Centre for Future Air-Space Transportation Technology and the MultiScale Flows Research Group. Close links with industry through contract research and industrial consultancy are enhanced by an Industrial Advisory Board on which local and national companies are represented. Courses for industry are also offered, principally in the areas of Energy Systems and Pressure Systems Design.

The Department is one of the biggest and best such departments in the UK. In the RAE 2008, over 70% of the Department's research was rated 'internationally excellent' or 'world-leading'. Our academic staff and researchers hold qualifications from major universities around the world, publish research in the leading international journals and give guest lectures at international conferences.

## RESEARCH CLUSTERS

### Engineering Science

Engineering Science deals with complicated engineering situations in which a number of competing causes lead to manifold effects. Both scale effects and the conditions of practice are important, and in that it often differs from the natural sciences. In Engineering Science at Strathclyde we ask ourselves what we can create that is useful, given the laws of physics and other practical constraints.

### Engineering Mechanics

Research encompasses computational mechanics, CAE, mechanics and dynamics of structures, impact and crash worthiness, pressurised systems, bioengineering, experimental analysis, elasticity, inelastic behaviour of solids and structures, probabilistic methods, properties of materials, advanced composites technology, fracture mechanics, stability of structural elements and systems. In Engineering Mechanics at Strathclyde, the key aim is to channel the results of the fundamentals of materials and structures into practical and useful engineering industry solutions.

## RESEARCH FACT FILE

The Centre for Future Air-Space Transportation Technology, cFASTT, is a research centre established in the Department in 2010 under Director Professor Richard Brown. The new centre is engaged in researching the technologies required for the next generation of high-speed airliners and access-to-space systems. Multidisciplinary in nature, the Centre draws on established expertise in hypersonic flow modelling and space mission and systems design.

As such, we are interested in a wide variety of disciplines, from high-speed aerodynamics, thermo-structures, advanced propulsion and aero-elasticity to spacecraft trajectory design, air traffic management, ergonomics, and systems engineering. The Centre is collaborating on several cutting-edge aerospace projects in conjunction with MoD/dstl, EADS Astrium, and the European Space Agency as well as with smaller, highly innovative companies within the UK, such as Reaction Engines and Fluid Gravity Engineering.

### Engineering Systems

This encompasses the development and application of new approaches to structural mechanics and dynamics, power generation, heat, mass and fluid transfer. New techniques are applied to the development and optimisation of sustainable engineering systems in the targeted areas of:

**Energy and Environment:** Research goals include improving the accuracy of the mathematical models and numerical methods used to represent building heat, mass and power flow; and applying simulation to optimise energy component performance and energy efficiency. Staff are also actively researching energy utilisation and demand side management and control, and low carbon and renewable energy systems.

**Health Engineering:** Research encompasses numerical analysis, computational fluid dynamics, materials, mechanics and latterly auto-associative neural networks. Its scope includes fundamental studies into the loading conditions that exist in arthritic wrists, applied studies to improve the function and design of vascular stents and the development of practical assistive technology devices that can be used to open packages. The work is supported by grants awarded by DTI/ EPSRC, Faraday Partnership, Arthritis Research Campaign, Furlong Foundation, Terumo Vasctek, and the European Commission.

**Aerospace and Transportation:** Work spans a range of length scales from experimental low speed aerodynamics to hypersonics and space. Our aerodynamics activities focus on the development of flow visualisation methods and computational modelling of hypersonic flows for re-entry. Our space activities focus on the orbital dynamics of solar sail spacecraft and the distributed control of swarms of micro-spacecraft. The programme of Aerospace research is funded by EPSRC, the EU and collaborative projects with DSTL, EADS Astrium Ltd and the European Space Agency.

### FACILITIES

The Department's large-scale laboratory facilities for teaching and research include:

- > Faculty Advanced Materials Research Laboratory
  - > state-of-the-art suite of materials analysis and characterisation equipment
  - > FE-SEM, W-SEM, XRD, ED-XRF, GD-OES, LFA/DSC, TMA, Porosimeter, modern test machines up to 250kN capacity
- > Faculty High Speed Computer (1088 cores)
- > 1.5m low-speed wind tunnel
- > 0.9m environmental wind tunnel
- > facilities for carrying out vibration and shock tests to British and ISO standards
- > latest techniques for diagnosing machinery condition from vibration signals
- > anechoic chamber
- > polymer processing laboratory
- > specialised optical strain measurement facility with data logging and instrumentation.
- > autoclave with 10 bar pressure capacity and temperatures up to 650°C

### RESEARCH DEGREES

The Department welcomes research proposals from applicants wishing to undertake an MPhil or PhD degree in areas relevant to our research expertise.

### CONTACT FOR RESEARCH DEGREES

Christina Rossi

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### MARTA CECCARONI

#### PhD Mechanical Engineering

The idea of a team of physicists, mathematicians and engineers working together in the Advanced Space Concepts Laboratory, where I am at present, immediately delighted me as a clear example of what research should be.

Working at Strathclyde is both challenging and exciting, constantly balancing research, publications, meetings, brainstorming and presentations for conferences. However it is this mixture of features that makes the experience unique and outstanding every day.

Strathclyde's leading role in engineering research, especially relating to space, and a well-connected network of contacts with the scientific community worldwide will benefit my future career both as an academic or in any space industry related job.

Add to this the fact that Scotland is one of the most beautiful, polite and welcoming countries I've ever visited and you can surely get a picture of how breathtaking such an adventure is to me.

# Advanced Mechanical Engineering

MSc/PgDip/PgCert

This course provides high calibre engineering graduates with an in-depth technical understanding of advanced mechanical engineering topics, together with transferable business and management skills sought by employers. The course is accredited by the Institution of Mechanical Engineers and provides a route to Chartered Engineer status.

## Course Structure

Students will have the opportunity to select up to nine technical/specialist advanced mechanical engineering classes, plus three business/management modules which are necessary to satisfy the key requirements to achieve Chartered Engineer status.

MSc students also undertake an individual project which may be industry-based or aligned to engineering research at Strathclyde.

It is recommended that technical classes are taken with an aerospace, energy or materials theme as follows:

### Aerospace

- > Advanced Topics in Fluid Systems Engineering
- > Aerodynamic Performance
- > Aerodynamic Propulsion Systems
- > Light Weight Structures
- > Machine Dynamics
- > Mathematical Modelling in Engineering Science
- > Spaceflight Mechanics
- > Systems Engineering 1
- > Systems Engineering 2

### Energy

- > Advanced Topics in Fluid Systems Engineering
- > Electrical Power Systems
- > Energy Modelling and Monitoring
- > Energy Resources and Policy
- > Machinery Diagnosis and Condition Monitoring
- > Mathematical Modelling in Engineering Science
- > Renewable Energy Systems
- > Systems Engineering 1
- > Systems Engineering 2

### Materials

- > Ceramic and Polymer Engineering; Engineering Composites
- > Metals and Alloys
- > Light Weight Structures
- > Machine Dynamics
- > Mathematical Modelling in Engineering Science
- > Pressurised Systems
- > Systems Engineering 1
- > Systems Engineering 2

### Generic Modules

- > Design Management
- > Project Management
- > Environmental Impact and Sustainability
- > Information Management
- > Finance
- > Risk Management

## Course Duration

MSc: 12 months full-time; PgDip/PgCert: 9 months full-time

## Entry Requirements

MSc: First- or second-class Honours degree, or equivalent, in engineering or physical science.

PgDip/PgCert: Normally a first degree in a relevant subject, but other applicants will be considered if they have equivalent industrial experience.

## Scholarships

Some funded studentships may be available for MSc or PgDip candidates. Please see [www.strath.ac.uk/search/scholarships/](http://www.strath.ac.uk/search/scholarships/) for details.

## Careers

Mechanical Engineers are in demand across the engineering sectors, including oil and gas, energy, aerospace, manufacturing and process industries. Therefore the career prospects of graduates are excellent due to the current skills shortage. This course meets the needs for graduate engineers who want to develop the advanced skills required to meet Chartered Engineer status.



# Power Plant Technologies (full-time)/ Power Plant Engineering (part-time)

MSc/PgDip/PgCert

These courses have been developed with industrialists to address skills shortages in the power generation sector. With input from across the engineering disciplines, they provide students with in-depth training in the operation of conventional, renewable and nuclear power plants. They are particularly relevant for graduates wishing to work in the power generation industry and the businesses that support it, or for employees already working in this field.

## Course Structure

The course consists of technical and generic skills instructional modules. Technical classes provide an overview of power plant operations and in-depth knowledge of power plant functions, maintenance and optimisation. Teaching combines academic and industrial lectures, with on-site visits to industry and seminars presented by visiting experts from the UK and overseas. This programme is accredited by the Institution of Mechanical Engineers.

### TECHNICAL MODULES

- > Power Plant Systems
- > Electrical Power Systems
- > Energy Resources and Policy
- > Advanced Boiler Technologies 1
- > Advanced Boiler Technologies 2
- > Environmental Performance and Related Technologies
- > Materials for Power Plant
- > Gas and Steam Turbines
- > Nuclear Power Systems

### GENERIC MODULES

In addition, students take three Faculty-wide generic modules, from the following, which meet employers' requirements for comprehensive engineering skills, and satisfy key requirements to reach Chartered Engineer status:

- > Design Management
- > Project Management
- > Environmental Impact and Sustainability
- > Information Management
- > Finance
- > Risk Management

Successful completion of six instructional modules leads to the award of a Postgraduate Certificate. Successful completion of twelve instructional modules leads to the award of a Postgraduate Diploma.

### INDIVIDUAL PROJECT

MSc students also undertake an individual project which may be industry-based or aligned to engineering research at Strathclyde.

### Course Duration

MSc: 12 months full-time; PgDip/PgCert: 9 months full-time  
The part-time Power Plant Engineering course is typically spread over three years.

### Entry Requirements

MSc: First- or second-class Honours degree, or equivalent, in engineering or physical science.

PgDip/PgCert: Normally a first degree, but other applicants will be considered.

### Scholarships

Some funded studentships may be available for MSc or PgDip candidates. Please see [www.strath.ac.uk/search/scholarships/](http://www.strath.ac.uk/search/scholarships/) for details.

### Careers

There are recognised skills shortages in the Power Generation sector which this course aims to redress. The course has been developed with companies and organisations including Doosan Babcock, Mott MacDonald, ScottishPower, Jacobs UK, Sinclair Knight Merz, Scottish Enterprise and the Industrial and Power Association.



## DID YOU KNOW

The MSc in Power Plant Engineering is Scotland's first part-time course providing accelerated training for those working in or wishing to work in the conventional or renewable power generation industry.



# Department of Naval Architecture and Marine Engineering

[www.strath.ac.uk/na-me](http://www.strath.ac.uk/na-me)

## RESEARCH DEGREES

MPhil, PhD

## TAUGHT COURSES

MSc/PgDip

**Marine Engineering**  
**Marine Technology\***  
**Offshore Floating Systems**  
**Offshore Renewable Energy\***  
**Ship and Offshore Structures**  
**Ship and Offshore Technology**  
**Subsea Engineering**  
**Technical Ship Management**

\* part of Faculty Sustainable Engineering Programme, see pg 16

## CONTACT FOR TAUGHT COURSES

Professor Shan Huang

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e: [shan.huang@strath.ac.uk](mailto:shan.huang@strath.ac.uk)



The Department of Naval Architecture and Marine Engineering (NA-ME) has a long history of offering high-quality courses in Naval Architecture and its related subjects. NA-ME has staff expertise covering all areas of Naval Architecture, Ship Design, Marine Engineering, Ocean Engineering, High-Speed and Small Craft Design. Located in its own premises (Henry Dyer Building) the Department's teaching and research infrastructure is well-established; in addition to lecture theatres, computing and study areas, and a large design office, students have access to laboratory and computing facilities unparalleled in university terms. The Department also has a racing yacht which students can use. Experiment facilities include the Hydrodynamics Laboratory (located at the West of Scotland Science Park), equipped with the largest university ship model experiment tank in the UK (76m x 4.6m x 2.4m), as well as a small towing/wave-making tank (25m x 1.5m x 1.0m), and a diesel engine test facility located in the Henry Dyer Building.

Powerful state-of-the-art software developed in-house and excellent commercial software tools are supported by extensive computing laboratory facilities. The University can also offer a large selection of other facilities, including materials testing and fluid mechanics laboratories, a wind tunnel, an advanced machine-tool laboratory and a CAD Centre.

## RESEARCH ENVIRONMENT

NA-ME is a highly active research department, with world-leading expertise in a number of areas. Staff are internationally recognised for their expertise in the safety of ships and marine installations, reliability of marine structures, advanced structural analysis, offshore engineering, marine environment sustainability, ship hydrodynamics and computer applications.

Our main research interests lie in:

- > ship stability and safety
- > marine hydrodynamics
- > marine structures

- > ocean engineering
- > marine engineering
- > emerging technologies
- > marine renewable energy and alternative fuels
- > marine design, operation and human factors

Students studying for an MPhil or PhD may carry out their research in any of these areas.

Our staff participate in a wide range of research projects and networks funded by the Engineering and Physical Sciences Research Council (EPSRC), EU, and the UK government. The Department makes a significant contribution to national, European and international policy-making in marine technology research and its application through the participation of members of staff in research bodies including the Foresight Transport Panel, the EPSRC College, the EU Research and Development Coordination Group, and WEGEMT (an association of 43 EU universities involved in Marine Technology and Related Sciences). Department staff are also involved in major international bodies including the International Standards Organisation, the International Maritime Organisation, the Offshore Structures Code, the International Towing Tank Conference and the International Ship and Offshore Structures Congress.

NA-ME attracts researchers and visiting academics from a wide range of prestigious institutions worldwide. Strong collaborative research links with UK and overseas universities provide the basis for continuous interchange between research staff and students. Recent

visitors include more than 20 academics from renowned universities all around the world.

NA-ME research activities are focused through three research centres and three research groups:

#### CENTRE FOR MARINE HYDRODYNAMICS

Building on its existing strength in hydrodynamics of ships and offshore structures, the Centre focuses on experimental fluid dynamics and computational fluid dynamics research. The Centre operates the Kelvin Hydrodynamics laboratory and is developing a variety of innovative experimental techniques, including techniques for investigation of unsteady resistance, determination of fluid forces on damaged vessels, generation of freak waves, and hydrodynamic performance of marine renewable energy devices. Research is supported by a range of bodies including EU and the Engineering and Physical Science Research Council.

#### MARINE STRUCTURES AND RELIABILITY CENTRE

Research is focused on efficient and improved strength and response modelling of offshore and ship structural components and systems. Methods for rational selection of partial safety factors, often in conjunction with inspection quality and timing, for structures degrading through fatigue and corrosion are investigated.

#### SHIP SAFETY RESEARCH CENTRE

The Ship Safety Research Centre (SSRC) is already acknowledged internationally as the leading centre on ship stability and safety. Efforts to promote a safety culture in the design and operation of ships have elevated safety-related research to top priority, thus providing new opportunities for growth. SSRC is developing research in Design for Safety to effectively combine national and European research efforts to target safety as a life-cycle issue for all safety-critical ship types.

#### SUSTAINABLE MARINE ENGINEERING GROUP

This group focuses on environmental impact of ship design, construction and operations, addressing areas such as marine exhaust gas emission reduction, efficient machinery and systems, engine combustion and simulation, alternative fuel, eg bio-fuels application in ships, fuel-cell technologies for ships, ballast water treatment, and marine oil pollution. The experimental research activities of the group are carried out in the Marine Engineering Laboratory which houses a diesel engine test-bed contained in an acoustic cell. As part of a collaborative research programme within the Faculty of Engineering, supported by the University and BP shipping, a 5kW solid oxide fuel cell test platform is currently being installed in the laboratory.

#### MARINE RENEWABLE ENERGY GROUP

This group integrates and develops existing activities in offshore wind/current/wave energy within the Department, and links with other departments in the University and throughout Scotland. The group's experimental research is carried out in the Hydrodynamics Laboratory.

#### MARINE DESIGN, OPERATION AND HUMAN FACTORS

This group's activities include multi-criteria ship design optimisation techniques for improving producibility and subdivision layout, and improved understanding of human factors in design and operation, including energy efficiency, maintenance and safety.

#### CONTACT FOR RESEARCH DEGREES

Thelma Will

t: +44 (0)141 548 4913

e: t.will@na-me.ac.uk



#### CHARLOTTE BANKS

PhD Student

Naval Architecture and Marine Engineering

**After completing my undergraduate degree in Naval Architecture with Small Craft Engineering I was offered the exciting opportunity of continuing my academic career at Strathclyde in the form of sponsored PhD research. Within eight months of starting my research I have already helped organise and participated in several international business meetings, conferences and research trips and I have made many worldwide contacts, including some within large and leading companies and organisations.**

**My supervisors offer help, guidance and expertise and the environment within our Department is hardworking but friendly, allowing for natural discussions and sharing of expertise and experiences. My research area (Low Carbon Shipping – Human Factors and Ship Operations) really interests me, particularly as it is such a new and rapidly growing topic. With this in mind and the contacts I am gathering I hope to remain and specialise within this field of research or industry in the years to come.**

# Marine Engineering

MSc/PgDip

This programme allows graduate engineers or those from related disciplines to specialise in, or convert to, Marine Engineering. Marine Engineering is concerned with the design, construction, installation, and support of the systems and equipment onboard marine vehicles, with particular emphasis on propulsion and control systems. High efficiency and low environmental impact of marine engines are the key factors in assuring economical operation and environmental protection in maritime transportation, which has important implications for both economic success and environmental impact.

## Curriculum

The programme has three components as follows:

- > Instructional Modules
- > Group Project
- > Individual Project (MSc only)

Instructional classes offered during the two semesters include modules such as:

- > Advanced Marine Engineering
- > Marine Engineering Simulation and Modelling
- > Energy Management Systems
- > Inspection and Survey
- > Maritime Safety and Risk
- > Marine Transport and Economics
- > Environmental Impact and Sustainability
- > Information Management
- > Risk Management
- > Finance
- > Systems Availability and Maintenance

Students with a lesser knowledge of marine engineering may be required to take the following modules instead of some of those listed above:

- > Ship Power Systems and Design
- > Marine Environment Protection and Safety
- > Marine Transmission and Propulsion Systems

## Course Duration

MSc: 12 months full-time; PgDip: 9 months full-time

## Entry Requirements

MSc: BEng with second-class Honours or equivalent qualification. PgDip: Applicants with marginally lower qualifications will be considered. Applicants with other qualifications will be considered on an individual basis.

## Careers

Graduates are prepared for openings in a wide range of challenging and rewarding careers in the marine and related industries. These include marine engineering machinery and system design, surveying, technical superintendence, project management, safety management, support services, classification societies and consultancy services.

# Offshore Floating Systems

MSc/PgDip

With the world-wide search for offshore oil and gas moving into increasingly hostile areas of ocean and deep and ultra-deep water, floating systems are becoming more widely used. Floating systems must be designed and built to withstand harsh environments with innovative methods and techniques being adopted to develop robust as well as economically efficient and safe structures.

In meeting these challenges, concern for the environment is of increasing importance.

This programme is designed for graduate engineers or those from related disciplines. It provides students with practical knowledge of offshore floating systems, their conceptions, design and installation, with a sound basis of mathematical and engineering fundamentals.

## Curriculum

The programme has three components as follows:

- > Instructional Modules
- > Group Project
- > Individual Project (MSc only)

Instructional classes offered during the two semesters include modules such as:

- > Inspection and Survey
- > Maritime Safety and Risk
- > Design and Construction of FPSOs
- > Risers and Mooring Lines
- > Dynamics of Floating Offshore Installations
- > Offshore Engineering Practice
- > Finite Element Analysis of Floating Structures
- > Modelling and Optimisation in Design
- > Advanced Marine Structures
- > Theory and Practice of Marine CFD

## Course Duration

MSc: 12 months full-time; PgDip: 9 months full-time

## Entry Requirements

MSc: BEng with second-class Honours or equivalent qualification. PgDip: Applicants with marginally lower qualifications will be considered. Applicants with other qualifications will be considered on an individual basis.

## Careers

Graduates will be well-prepared for a challenging career in all sectors of offshore engineering dealing not only with offshore floating systems but also fixed marine structures.

## Ship and Offshore Structures

MSc/PgDip

This programme was developed following an increase in demand for design engineers who can design and assess new ships and offshore structures. It is designed for graduate engineers or those from related disciplines who will be introduced to ultimate strength, fatigue and design concepts for structural components of ships and offshore floating systems. The programme will provide students with knowledge of material behaviour together with factors influencing the dynamic behaviour of offshore installations.

### Curriculum

The programme has three components as follows:

- > Instructional Modules
- > Group Project
- > Individual Project (MSc only)

Instructional classes offered during the two semesters include modules such as:

- > Risers and Mooring Lines
- > Dynamics of Ships and Floating
- > Offshore Structures
- > Reliability-based Structural Design and Plated Structures
- > Ultimate Strength of Ship and Shell Structures
- > Computational Modelling and Approximation in Structural Mechanics
- > Computational Modelling of Non-linear Problems in Structural Mechanics
- > Materials Engineering

### Course Duration

MSc: 12 months full-time; PgDip: 9 months full-time

### Entry Requirements

MSc: BEng with second-class Honours or equivalent qualification.  
PgDip: Applicants with marginally lower qualifications will be considered. Applicants with other qualifications will be considered on an individual basis.

### Careers

There is currently a shortage of Naval Architects and Structural Engineers. Graduates from this programme will find jobs with oil and gas firms, classification societies and consultancy firms dealing with ship and offshore design.

## Ship and Offshore Technology

MSc/PgDip

This programme is designed for graduate engineers or those from related disciplines who wish to acquire advanced knowledge on ship and offshore technologies. The course is offered jointly between the University of Strathclyde and Hamburg University of Technology in Germany, and the awards are made in the name of both universities.

### Curriculum

First Year at the University of Strathclyde;

- > Offshore Engineering Practice
- > Risers and Mooring Lines
- > Marine Pipelines
- > Dynamics of Floating Offshore Installations
- > Maritime Safety and Risk
- > Design and Construction of FPSOs
- > Theory and Practice of Marine CFD
- > Inspection and Survey
- > Group Project
- > Research Project

Second Year at the Hamburg University of Technology;

- > Structural Analysis of Ships & Offshore Structures
- > Sea-keeping of Ships
- > Advanced Ship Design
- > Manoeuvrability
- > Fatigue Strength of Ships and Offshore Structures
- > Ship Vibration
- > Master Thesis
- > Seminar Naval Architecture and Ocean Engineering
- > Computational Fluid Dynamics
- > Nonlinear Structural Analysis
- > Special Topics of Ship Propulsion
- > German I or II (where appropriate)

### Course Duration

MSc: 24 months full-time; PgDip: 9 months full-time

### Entry Requirements

MSc: BEng with second-class Honours or equivalent qualification.  
PgDip: Applicants with marginally lower qualifications will be considered. Applicants with other qualifications will be considered on an individual basis.

### Careers

There is a great demand for graduates from this programme who find jobs in oil and gas companies, yards for design and construction of offshore construction vessels, subsea system manufacturing firms, classification societies, firms specialising in riser and mooring analysis, marine consultancies, and provision of ship equipment.

# Subsea Engineering

## MSc/PgDip

This programme is designed for graduate engineers or those from related disciplines who wish to acquire advanced knowledge on subsea systems, their conceptions, design and installation. These include systems and equipment such as pipelines, wellheads, drilling rigs and riser and mooring systems.

As oil is required to be extracted in deeper and rougher seas, new demands continue to be imposed on design development as well as new installation and inspection techniques.

### Curriculum

The programme has three components as follows:

- > Instructional Modules
- > Group Project
- > Individual Project (MSc only)

Instructional classes offered during the two semesters include modules such as:

- > Inspection and Survey
- > Maritime Safety and Risk
- > Risers and Mooring Lines
- > Marine Pipelines
- > Subsea Systems and Installation
- > Offshore Engineering Practice
- > Subsurface Technology
- > Dynamics of Floating Offshore Installation
- > Theory and Practice of Marine CFD
- > Computational Free Surface Hydrodynamics

### Course Duration

MSc: 12 months full-time; PgDip: 9 months full-time

### Entry Requirements

MSc: BEng with second-class Honours or equivalent qualification.

PgDip: Applicants with marginally lower qualifications will be considered. Applicants with other qualifications will be considered on an individual basis.

### Careers

There is a great demand for graduates from this programme who find jobs in oil and gas companies, subsea system manufacturing firms, classification societies, firms specialising in riser and mooring analysis, and marine consultancies.



### KATIE JORDAN

#### MSc Subsea Engineering

**After completing my undergraduate degree at Strathclyde I knew there was no place I would rather be doing my postgrad in Subsea Engineering!**

**Academically Strathclyde's Naval Architecture and Marine Engineering Department is very highly thought of internationally within the industry. The course itself is well structured, has links with industry and is really enjoyable to be a part of. I have gained invaluable knowledge that will be a substantial foundation for my chosen career path. Furthermore staff within the Department are encouraging and welcoming and make you feel like part of the university community.**

**Socially, Glasgow is a fantastic city with buzzing nightlife all year round. Also Strathclyde has loads of clubs and societies which are great (and easy) to get involved in.**

**I can say without a shadow of doubt that Subsea Engineering at Strathclyde has helped me achieve my dream graduate job and in September I will be starting with the oil giant, Talisman.**

## SCHOLARSHIPS & FUNDING

BP has recently established a Scholarship Programme offering great opportunities for postgraduate and undergraduate students within the Department of Naval Architecture & Marine Engineering. Only nine UK universities are included in the new Scholarship Programme and Strathclyde is the only Scottish member. Two scholarships of the value of £7,500 are available on a competitive basis to MSc students within the Department.

Postgraduate MSc and Diploma students from EU countries may be able to get fees-only support from Student Awards Agency for Scotland ([www.saas.gov.uk](http://www.saas.gov.uk)). Applications should be made to the Department in the first instance.

# Technical Ship Management

## MSc/PgDip

This programme is designed to give graduate engineers and well-qualified sea-going personnel an opportunity to acquire the knowledge and skills required for technical ship management. The programme develops an in-depth understanding of those subjects essential for effective and efficient management of ships and fleets, which is of vital importance to the shipping industry with 90% of world trade being carried by sea.

With in-depth knowledge in ship operations, graduates of the course will be capable of making significant contributions to the industry as technical ship superintendents/managers.

### Curriculum

The programme has three components as follows:

- > Instructional Modules
- > Group Project
- > Individual Project (MSc only)

Instructional classes offered during the two semesters, include modules such as:

- > Marine Transport and Economics
- > Maritime Law, Contracts and Insurance
- > Maritime Safety and Risk
- > Maritime Regulatory Framework
- > Inspection and Survey
- > Energy Management Systems
- > Systems Availability and Maintenance

### Course Duration

MSc: 12 months full-time; PgDip: 9 months full-time

### Entry Requirements

MSc: BEng with second-class Honours or equivalent qualification.

PgDip: Applicants with marginally lower qualifications will be considered. Applicants with other qualifications will be considered on an individual basis.

### Careers

There is a great demand for well-qualified technical ship superintendents/managers. Graduates will be able to make a valuable contribution to the currently booming shipping industry. Employment opportunities are also available in ship insurance firms.



### DID YOU KNOW

Catalina is a Sigma 33 racer/cruising yacht which is available for all students of the department to use, under the supervision of our experienced skippers. Students of the department have the opportunity to gain their RYA Day Skipper qualification through a theoretical course offered by the Department, which contributes to their degree, together with a practical course on the yacht.

# National Centre for Prosthetics and Orthotics

[www.strath.ac.uk/prosthetics](http://www.strath.ac.uk/prosthetics)

## RESEARCH DEGREES

MPhil, PhD

## TAUGHT COURSE

MSc Rehabilitation Studies

The National Centre for Prosthetics and Orthotics (NCPO) has a wide network of collaborative links with other departments in the Faculty of Engineering and the Faculty of Humanities & Social Sciences, and also with clinical and research facilities across the UK and overseas. The Department's purpose-built facilities include fully-equipped workshops, an environmental-controlled laboratory, pressure measurement and scanning systems, rapid prototyping facilities and a respiratory gas monitoring system.

## RESEARCH

The NCPO has an active and expanding research portfolio of fundamental and applied research projects. Staff members have collaborative national and international links and attract research income from a variety of sources such as governments, charities and research councils. NPCO's research activities are grouped under main themes:

- > Clinical Activities
- > Development and Evaluation of Clinical Techniques
- > Evaluation of Prosthetic and Orthotic Interventions
- > Development and Evaluation of Outcome Measures
- > Quality of Life Products
- > Clinical Evaluation Tools
- > Components
- > Technologies
- > Clinical Simulation for Prescription
- > Shape Capture

## RESEARCH DEGREES

We welcome suitably-qualified individuals from a variety of disciplines to pursue research leading an MPhil or PhD. Degrees can be completed on either a full-time or part-time basis, both on and off campus.

## CONTACT FOR RESEARCH DEGREES

Dr Tony McGarry

t: +44 (0)141 548 5868

e: [anthony.mcgarry@strath.ac.uk](mailto:anthony.mcgarry@strath.ac.uk)

## Rehabilitation Studies

MSc (by distance learning)

We welcome suitably-qualified individuals from a variety of disciplines to pursue an MSc by distance learning in the following disciplines: Prosthetics Rehabilitation Studies, Orthotics Rehabilitation Studies, Prosthetics and Orthotics Rehabilitation Studies, Rehabilitation Studies. The title of the degree will be dependent on the modules chosen.

## CONTACT

Dr Kevin Murray

t: +44 (0) 141 548 3929

e: [kevin.d.murray@strath.ac.uk](mailto:kevin.d.murray@strath.ac.uk)



## RESEARCH FACT FILE

A team of researchers at the National Centre for Prosthetics and Orthotics has been involved in developing SPEEAD (Sporting Prosthetics for Everyday and Elite Athletes with a Disability) project activities. The project steering group includes researchers from key prosthetics industry partners and the project is managed by Sarah Deans, prosthetics lecturer at the NCPO. A key activity is to build research capacity in order to inform and shape sporting prosthetics best practice and the collaboration has grown the level and nature of expertise and research capacity in the wider disability sports community. Already the project has developed a collaborative network of sports-related specialists who will contribute to postgraduate courses and CPD events; and has delivered an awareness-raising conference for the UK research and practitioner community and master classes for users of prostheses. A further Sporting Prosthetics conference is planned for November 2011 with international representatives from the fields of academia, sport and prosthetics.







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## Information for Prospective Students



Choosing a university is an important decision. Before making that decision you will want to gather as much information as possible. The following should be among your first choices for advice and assistance:

### THE UNIVERSITY WEBSITE [www.strath.ac.uk](http://www.strath.ac.uk)

Here you will find a comprehensive range of information. Whatever your interest or field of expertise, whether you want to enrol in a taught course or undertake research, full-time, part-time, distance or open learning, our website provides the answer to many of your questions. And if you don't find what you are looking for right away, you will at least be guided to someone who can help.

### RECRUITMENT & INTERNATIONAL OFFICE [www.strath.ac.uk/rio](http://www.strath.ac.uk/rio)

If you are interested in studying at Strathclyde as a postgraduate student, staff from the University's Recruitment & International Office (RIO) can give you all the help and advice you need to make your decision – from information about applying and courses to information specifically relevant to you, whatever your circumstances, wherever you're from.

If you live outside the UK, the University also has agents and representatives in many countries around the world. You can find a list on the RIO website (see above).

We know that you may have queries about the course you are applying to and about life in Glasgow, so throughout the year, University staff attend education exhibitions in the UK and abroad

at which you can find out more about the University and about studying at Strathclyde. The RIO website lists the dates of these events and we can send you details of opportunities to meet staff or, if you wish, to visit the University. If you would like to visit the University, please contact us.

### CONTACT

Recruitment & International Office, University of Strathclyde  
50 George Street, Glasgow UK, G1 1QE

t: +44 (0)141 548 2913

e: [pgenquiries@strath.ac.uk](mailto:pgenquiries@strath.ac.uk) (within UK/EU)

e: [international@strath.ac.uk](mailto:international@strath.ac.uk) (non-UK/EU)

### BRITISH COUNCIL [www.britishcouncil.org](http://www.britishcouncil.org)

The British Council represents British higher education around the world. Contact a British Council office in your home country.

### DID YOU KNOW

If you are an overseas student paying full-time international student fees, you are entitled to four weeks pre-session English language tuition and four hours per week in-session tuition – all for free.

## Before You Apply

### ENTRY REQUIREMENTS

The University admits students with a range of both academic and professional qualifications. In addition to an appropriate academic qualification (generally a strong undergraduate degree, or equivalent qualification), some courses require relevant professional or work experience.

The University welcomes applications from candidates with degrees or other qualifications from overseas institutions. If you are unsure whether your qualification is acceptable to the University, please contact the Recruitment & International Office for further advice. You can also check the entry requirements specific to your country at [www.strath.ac.uk/rio/prospective](http://www.strath.ac.uk/rio/prospective)

### APPLICATIONS

There is no formal closing date for most postgraduate applications but we advise you to apply as soon as possible, preferably by the end of March for entry in September. Applications are considered and decisions given on a rolling basis by most Departments; exceptions to this will be specified in the relevant course entry. If you wish to be nominated by the University for any scholarship or funding, we recommend that you apply as early as possible.

Visit [www.strath.ac.uk/admissions](http://www.strath.ac.uk/admissions) for details of the application process.

### ENGLISH LANGUAGE REQUIREMENTS

If English is not your first language, you must provide evidence of your proficiency in English before starting your course. We accept a number of English language qualifications, but the IELTS (International English Language Testing Service) or the TOEFL (Test of English as a Foreign Language) exams are the most widely accepted:

- > IELTS: Overall score required for postgraduate study is generally IELTS 6.5 or equivalent. For information about taking the IELTS exam, contact the local British Council Office in your own country or look at the IELTS website at [www.ielts.org](http://www.ielts.org)
- > TOEFL: Overall score required is 90-95 in the internet-based test (iBT). For information on the TOEFL, contact the US Embassy in your own country or look at the TOEFL website at [www.ets.org](http://www.ets.org)
- > Other tests and grades may be acceptable to the University and you should contact English Language Teaching or look on the Recruitment & International Office website for advice on alternative English language tests.

### Pre-study English tuition

If your proficiency in English is not at the required level, English Language Teaching (ELT) runs programmes to help, including the Postgraduate Diploma in English, Pre-Entry Language Preparation and the summer English for Academic Purposes Pre-session programme. The final four-week Pre-session module is offered free of charge to students who register for a degree programme at the University and who pay full international student fees for at least one academic year.

### Ongoing English tuition

The ELT runs classes throughout the year to help you continue to improve your English. Students on full-time programmes paying international student fees can benefit from free tuition of up to four hours per week for as long as they are at Strathclyde. For details of these courses and other English language support services, visit our website.

### CONTACT

t: +44 (0)141 548 3065/4478

e: [hass-courses-hum@strath.ac.uk](mailto:hass-courses-hum@strath.ac.uk)

w: [www.strath.ac.uk/elt](http://www.strath.ac.uk/elt)

## UK POINTS-BASED SYSTEM OF IMMIGRATION

Tier 4 (students) from non-European Economic Area (EEA) countries and Switzerland who normally require a visa to study in the UK need to obtain 40 points in order to be given a Tier 4 (General) Student Visa. Points are gained as follows:

- > A Confirmation of Acceptance for Studies (CAS) (worth 30 points) will be issued by the University of Strathclyde when you accept our Offer of Study, meet any conditions mentioned in our Offer of Study and pay the University's standard deposit of £2,000. This is an advance payment and will be offset against the amount of your tuition fees. If you have an official financial sponsor you will not have to pay this deposit. You should send a copy of your sponsorship letter to the University's Finance Office before your CAS will be issued.
- > You will be given the remaining 10 points when you provide evidence to the Entry Clearance Officer who is considering your visa application that you have:
  - > the full amount of your tuition fee for your first year of study and maintenance of £600 per month for the first nine months of your study
  - > an additional £400 per month for the same period for every dependent who may accompany you

You can keep up-to-date by checking the following websites:

#### Information & Advice

[www.strath.ac.uk/sees/infont](http://www.strath.ac.uk/sees/infont)

#### UK Council for International Student Affairs

[www.ukcisa.org.uk](http://www.ukcisa.org.uk)



## Your Strathclyde Experience



## Our Courses

### OUR DEGREES

Strathclyde is one of the largest providers of postgraduate education in the UK. Taught Master's degrees (MSc, MBA, LL.M, MLitt, MArch, MEd) and Postgraduate Diplomas and Certificates (PgDip/PgCert) are offered in most departments, as are research degrees of PhD, MPhil, MRes, DBA, DEdPsy, DPharm, DPpsych, EdD and EngD.

### Taught Courses

The duration of most taught courses is one year, normally starting in late September at the beginning of the academic year. Taught courses involve a combination of formal lecture and/or seminar programmes and a great deal of emphasis is placed on individual study. As well as attending classes, you will be expected to spend time studying on your own, either working on group or individual assignments or developing your knowledge through reading.

You will be assessed at various points throughout the academic year through examinations, assessed coursework, group work and seminars.

Many courses conclude with a project on a relevant topic of your choice. These courses are intended to provide advanced knowledge or techniques in specialised aspects of subjects you studied more generally at undergraduate level. Some taught courses also serve as conversion courses for those who wish to change disciplines, upgrade their knowledge within a discipline or prepare for further study.

### Research Degrees

Registration for research degrees normally takes place in September, although it is possible to start at other times. The aim of a research degree is to provide a thorough training in a particular subject area through original exploration and experiment, culminating in the preparation of a thesis setting out the conclusions

of the research you have undertaken. You will be working on your own under the guidance of an academic supervisor and your progress will be monitored through regular meetings and submission of your research findings.

### COURSE STRUCTURE

Many of our programmes can be undertaken full-time, part-time, or on a modular basis. Distance or open-learning options are also available on some courses. Please note that non-EEA (European Economic Area) international students are not eligible for part-time study programmes based in the UK due to visa restrictions.

### DID YOU KNOW

Strathclyde was the first UK Business School to offer a one-year full-time MBA (in 1966). It was also the first to offer a distance-learning MBA.

Strathclyde Law School was the first in Scotland to offer the LLB by part-time study.

Strathclyde's postgraduate course in Environmental Entrepreneurship was the first in Europe, and its postgraduate course in Environmental Forensics was the first in the UK.

## Careers & Work Experience

Whatever your reasons for embarking on postgraduate study, your career development is an integral part of your postgraduate education. Undertaking a postgraduate course at Strathclyde means that you will be able to benefit from one of the UK's best university careers services. Our Careers Service has been awarded the Government's Charter Mark for the quality of its service five times and in 2009 came joint 2nd in the UK in an employer-commissioned student satisfaction survey. Its resources and advisers can help you to make the most of your qualification, whether you are on a taught or research degree.

The Careers Service can help you to plan for the future by:

- > thinking through your career options
- > finding out about vacancies in our careers resource centre or via our website – we have information on hundreds of graduate occupations and national and international employers
- > improving your presentation to employers in applications, interviews and assessment centres through seminars or with individual assistance from experienced, professional careers advisers

The Careers Service maintains close links with a wide range of employers who advertise vacancies on our website and meet students at presentations in the autumn and spring.

Some courses provide a work placement experience; these are noted in the relevant course entries in this prospectus.

### CONTACT

Careers Service  
**t:** +44 (0)141 548 4320  
**e:** [yourcareer@strath.ac.uk](mailto:yourcareer@strath.ac.uk)  
**w:** [www.strath.ac.uk/careers](http://www.strath.ac.uk/careers)

## Money Matters

### COST OF LIVING

Glasgow is one of the most affordable places to live in the UK. Your living costs will depend on your lifestyle and the type of accommodation you choose, but on average the weekly costs as a student in University accommodation are approximately £140-170. These figures are based on the costs of self-catering accommodation and other weekly expenses of around £75. You should also budget for up to £500 for items such as books, bedding, stationery, clothing. In the private sector you might pay £65-85 per week for a room in shared accommodation, usually excluding heating. If you are looking for a place to house your partner and/or family, you would pay between £110-£150 per week, depending on the size and location of the apartment. A total estimate for a postgraduate academic year based on 12 months/50 weeks is between £7,000 and £9,000.

### TUITION FEES

Please note that your tuition fees will depend on what course you are studying and where you are from. The fees shown in the box are an average and intended as a guide only. Fees for 2012/2013 may be up to 3% higher and will be confirmed in March 2012. The cost of your course will be available from the contact included in each course listing.

## Working after your studies

From April 2012, the Post Study Work scheme, entitling graduates to remain in the UK to find employment will close. However, students will be able to switch into Tier 2 if they are in the UK and find suitable employment with a UKBA licensed Tier 2 sponsor before their student visa expires. Further information and updates on changes to the immigration system can be found at [www.ukba.homeoffice.gov.uk](http://www.ukba.homeoffice.gov.uk) and updates on how changes will affect students will be noted on the Information and Advice website: [www.strath.ac.uk/sees/infoint](http://www.strath.ac.uk/sees/infoint)

The Relocation Advisory Service is a one-stop-shop information centre offering a seamless service that simplifies the process for people to relocate to Scotland to live and work. For further information visit [www.scotlandistheplace.com](http://www.scotlandistheplace.com)



## Tuition fees 2011/2012 full-time postgraduate taught courses

### OVERSEAS STUDENTS (NON-UK, NON-EU)

> Faculty of Engineering	£12,980
> Faculty of Humanities & Social Sciences	£9,950
> Faculty of Science	£12,980
> Strathclyde Business School	£10,100

### HOME STUDENTS (UK & EU)

> All Faculties	£3,400
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Several courses, particularly within the Strathclyde Business School, have non-standard fees and you should contact the relevant Department or the Recruitment & International Office to clarify the tuition fees for your course.

## Your Strathclyde Experience



### SCHOLARSHIPS & FINANCIAL HELP

The University offers a range of scholarships for UK, EU and overseas students. The University has a searchable database of scholarships and bursaries at:

[www.strath.ac.uk/search/scholarships/](http://www.strath.ac.uk/search/scholarships/)

The University's Careers Service has various information resources to help with postgraduate study and funding enquiries. Funding information includes the Grants Register, scholarship and sponsorship information:

[www.strath.ac.uk/careers/postgradstudy](http://www.strath.ac.uk/careers/postgradstudy)

There are also many funding opportunities available through individual departments or tied to specific courses and made available from industry sponsors or partners, research councils, etc. Check with the department responsible for your course. If you are a research student, you may be able to supplement your income by undertaking paid work within your department.

### Applying for Scholarships

In order to apply for a scholarship, you must first have applied for a course of study. Information on how to apply for each scholarship is listed on the scholarship database under each scheme. Contact us if you have any questions on the scholarship database or applications for scholarships: [scholarship.enquiries@strath.ac.uk](mailto:scholarship.enquiries@strath.ac.uk)

### Other sources of funding – EU and European Economic Area (EEA) students

If you are an EU national, you are eligible to apply for the same awards as UK students to cover your tuition fees. You may be eligible to receive maintenance support if you have been living in the UK for three years excluding for study purposes, immediately prior to the study period. You should consult the Course Director or Head of Department to find out if funding is available for the course or research area you are interested in, as such awards are limited. General information for EU students is available at <http://ec.europa.eu/ploteus>

### Other sources of funding – international students

If you are an international student from a non-EU/EEA country, you should explore funding opportunities in your home country at the same time as applying for funding in the UK. Contact the relevant Ministry or Department of Education, local British Council Office, British Embassy or High Commission.

Some international agencies such as UNESCO, the World Bank, the World Health Organisation and the European Commission operate funding schemes, usually for students from developing countries. Voluntary organisations such as religious bodies and charities sometimes award modest scholarships. The following websites have details on scholarships and funding sources:

- > [www.prospects.ac.uk/links/fundstudy](http://www.prospects.ac.uk/links/fundstudy)
- > [www.ukcisa.org.uk](http://www.ukcisa.org.uk)
- > [www.iefaf.org](http://www.iefaf.org)
- > [www.studentmoney.org](http://www.studentmoney.org)
- > [www.acu.ac.uk](http://www.acu.ac.uk)
- > [www.internationalscholarships.com](http://www.internationalscholarships.com)
- > [www.unesco.org](http://www.unesco.org)
- > [www.postgraduatestudentships.co.uk](http://www.postgraduatestudentships.co.uk)

### Funding Enquiries

#### UK STUDENTS

The University's Student Financial Support Team offers information and advice to UK students considering postgraduate study or who encounter financial difficulties during their studies. The team monitors the financial support available from government and other sources. Assistance is available through the Discretionary and Childcare funds for students experiencing financial hardship.

### CONTACT

**e:** [s.finance@strath.ac.uk](mailto:s.finance@strath.ac.uk)

**w:** [www.strath.ac.uk/student/finance](http://www.strath.ac.uk/student/finance)

## Academic and Study Support

To enhance the learning experience at Strathclyde students can expect support from their Department, but also from services provided across the University. The University's investment in facilities, services and support help you make the most of your student experience at Strathclyde.

### INFORMATION TECHNOLOGY

[www.strath.ac.uk/it](http://www.strath.ac.uk/it)

At Strathclyde you will benefit from 21st-century IT provision, including:

- > over 40 computer laboratories, teaching rooms and library spaces containing more than 1,500 PCs, many available 24 hours a day
- > access to personal, individual curriculum and academic information via PEGASUS (Portal Engine Giving Access to Strathclyde University Systems) from your computer or mobile device.
- > 400 wi-fi hot-spots campus-wide allowing free wireless network access, plus network connectivity in all student residences and serviced laptop user areas
- > personal University user account with free email, web access and 100 megabytes of backed-up disk-space for the duration of your studies
- > a Development & Training Resource Centre where you will find tutorial and training manuals

### LIBRARY FACILITIES

[www.lib.strath.ac.uk](http://www.lib.strath.ac.uk)

The University is investing in the Library to develop and modify facilities to meet the needs of students and staff. This enhanced portfolio of facilities will include the redevelopment of the Library building, introduction of compact mobile shelving, increased focus on acquiring digital content and provision of more group and individual study spaces.

There are currently more than 2,000 reader places, 450 computer places and extensive wi-fi zones for laptop use. The Library is particularly strong in science, engineering, technology, language and literature, business studies and management and also holds Scotland's largest resource in education and teacher training. The Library holds over one million print volumes as well as access to over 126,000 electronic books that can be accessed 24/7 from any suitably-enabled computer.

Other services include an open-access print Short Loan Collection, e-books and digitised collections of exam papers and other learning materials. Users also have online access to British Standards and Codes of Practice, as well as databases in a range of subject areas with links to full-text electronic sources. The Library holds an important collection of government publications and documents published by other international agencies. It is responsible for the historical archives of the University and also contains the special collections of rare books and other materials. Library staff are also available to offer training on information literacy and how to use electronic resources.



### FACT FILE: ACADEMIC SUPPORT

The Centre for Academic Practice & Learning Enhancement provides services tailored for postgraduate students, including seminars and workshops in areas such as oral presentation and academic writing, personal effectiveness and critical information handling. For details visit [www.strath.ac.uk/caple](http://www.strath.ac.uk/caple)

## Your Strathclyde Experience

### Accommodation

[www.strath.ac.uk/accommodation](http://www.strath.ac.uk/accommodation)

Glasgow is one of Europe's most exciting and beautiful destinations, combining the energy and sophistication of a great international city with some of Scotland's most renowned and spectacular scenery on its doorstep. Served by two international airports and with easy connections from London, Edinburgh or other major cities, Glasgow is very accessible.

The University sits in the heart of Glasgow, only a short walk from the city's main railway stations, 20 minutes drive from Glasgow International Airport and 45 minutes by train from Glasgow Prestwick International Airport.

#### University Accommodation

The University has accommodation for around 2,000 single students in self-catering flats in the heart of Glasgow. Most students live on campus in the Student Village, with a further 400 in University accommodation within five minutes walking distance of the campus.

#### ACCOMMODATION ELIGIBILITY

Full-time students who are new to Glasgow and live at least 25 miles outside the city are given priority for a place in University accommodation. University accommodation is guaranteed for all single students paying fees at the overseas rate provided they apply before the application deadline. If we cannot offer University accommodation, we will help you to find accommodation in the private rented sector.

#### COUPLES/FAMILIES

The University leases two flats suitable for couples in the city centre and owns and manages 23 flats for families in Cumbernauld, about 12 miles east of Glasgow.

If you plan to bring your family to Glasgow, we advise you to do so only after you have found suitable, affordable accommodation.

#### HOW TO APPLY FOR ACCOMMODATION

Applications will be accepted from January. Places will be confirmed after firm offers of academic admission have been made.

#### CONTACT

Barbara Manson  
Accommodation Services Manager  
t: +44 (0)141 548 3454/3561  
e: [student.accommodation@strath.ac.uk](mailto:student.accommodation@strath.ac.uk)

#### THE PRIVATE RENTAL SECTOR

There has been a dramatic increase in the availability of rented accommodation in the private sector in Glasgow, particularly in areas close to the University. There are three main types of accommodation generally available – shared furnished flats (apartments), self-contained flats or rooms within family homes. The University's Accommodation Office operates PAD (Private Accommodation Database, [www.glasgowpad.org](http://www.glasgowpad.org)), a web-based service which has been set up especially for students to find a safe, secure place to stay.

As a guide, the cost of a reasonable flat in the private rented sector is £450 to £600 per month, depending on the size of the property. Our Accommodation Office can provide help and advice about contracts, tenancy agreements, and the relevant gas safety and multiple occupancy requirements.

Information and assistance can be obtained from the Accommodation Office website (see above).





## Student Support

[www.strath.ac.uk/sees/infoint](http://www.strath.ac.uk/sees/infoint)

The University provides a range of services, advice and assistance to help ensure that all of our students enjoy their time here. Our Information & Advice Team offers advice, guidance and information on all issues associated with student life to home and international students, especially those that concern welfare, academic, immigration and personal issues.

The team is also responsible for student transition, including induction and orientation activities for home and international students, and for the administration and analysis of key student surveys. You can access more detailed information on our website (see above).

### CONTACT

e: [tier4@strath.ac.uk](mailto:tier4@strath.ac.uk)

e: [infoandadvice@strath.ac.uk](mailto:infoandadvice@strath.ac.uk)

### INTERNATIONAL COMMUNITY

The University's lively and varied international student population comes from over 100 countries and is fully integrated into university life. We provide expert advice and support to our international community and can help with student visa extensions, immigration advice, advice on working in the UK, financial queries, advice on travelling outwith the UK, general welfare issues and general support.

### CONTACT

e: [international.adviser@strath.ac.uk](mailto:international.adviser@strath.ac.uk)

### STUDENT COUNSELLING SERVICE

[www.strath.ac.uk/studentcounselling](http://www.strath.ac.uk/studentcounselling)

Confidential support and counselling is available to all students. We have specialised staff to address any University matters or student welfare issues and who can provide individual assistance with your personal or academic concerns.

### CONTACT

e: [student-counselling@strath.ac.uk](mailto:student-counselling@strath.ac.uk)

### STUDENT FINANCE AND WELFARE

[www.strath.ac.uk/student/finance](http://www.strath.ac.uk/student/finance)

The Student Financial Support team offers information and advice, including details of the latest changes in government policy on student finance. If you have questions regarding fees, bursaries or scholarships, please contact us.

If you encounter financial difficulties during your time at University, there is a Discretionary Fund for students with serious money problems, and a Childcare Fund, which may be used to help with childcare costs, as well as other possible sources of assistance. The University can make short-term loans to students in difficulty or assist with Career Development Loans, welfare benefits or budgeting advice, and we also provide assistance or information relevant to students in particular categories (ie part-time or mature students).

### CONTACT

e: [s.finance@strath.ac.uk](mailto:s.finance@strath.ac.uk)



### STUDENT HEALTH SERVICE

[www.strath.ac.uk/ps/studenthealthservice](http://www.strath.ac.uk/ps/studenthealthservice)

The Student Health Service (SHS) helps students with any physical or emotional problems. Hospital-based doctors run a clinic on campus twice daily during term and a family planning/healthcare clinic weekly.

All students require to register with a local doctor. To receive any treatment through the National Health Service (NHS) you have to be registered with a doctor (GP). The SHS can give you information about local GPs. International students on courses longer than six months are eligible to register with the NHS, which means consultations with a doctor and hospital treatment will be free of charge. If your course is less than six months long, you may still be eligible for treatment under the NHS if you are from a country that has a reciprocal health agreement with the UK. Check [www.dh.gov.uk](http://www.dh.gov.uk) for details. If you are not entitled to NHS treatment you will have to pay the full cost of any treatment you receive in the UK. This can be expensive, therefore we would advise you to have medical insurance that covers you while living abroad.

Students from some countries are required to have a TB screening test at registration and the SHS will arrange this.

### CONTACT

e: [studenthealth@strath.ac.uk](mailto:studenthealth@strath.ac.uk)

## Your Strathclyde Experience

### DISABILITY SERVICE

[www.strath.ac.uk/disabilityservice](http://www.strath.ac.uk/disabilityservice)

The Disability Service offers advice, support and practical assistance to students and University staff so that students with any medical condition or disability (seen or unseen) can derive equal benefit and enjoyment from studying at Strathclyde.

Disability advisers identify effective strategies, assistive equipment or software, facilities or services which can support you during your time at Strathclyde. This might include mentoring, study skills sessions, or accessing support with communication or notetaking in lectures. The University's Assistive Technology advisers can help identify appropriate technology to support you and can provide ongoing advice, assistance and training.

The Disability Service can formally communicate any reasonable adjustments to your department about your teaching and assessment requirements, such as extra time in exams or advance copies of lecture handouts. The department is not informed of the nature of your disability. There is also a disability contact within each department.

The Disability Service also provides courses, such as the Effective Learning Programme and training in the use of assistive software, such as Mind Genius and Read and Write. These help you to make the most of university facilities and teaching, as well as providing an opportunity for you to meet other students.

Students with mobility difficulties or problems relating to stamina may find the steep hills and busy roads of the campus a challenge, but most classes can be timetabled in rooms that are accessible. The Disability Service will identify the most accessible routes or provide help in the event that a class is not in accessible premises.

You can read about support on the Service's website, where you can also access the University's Disability Policy. Please ask if you would like any of this information in another format.

### CONTACT

**t:** +44 (0)141 548 3402

**Minicom:** +44 (0)141 548 4739

**e:** [disabilityservice@strath.ac.uk](mailto:disabilityservice@strath.ac.uk)

### CHAPLAINCY CENTRE

[www.strath.ac.uk/chaplaincy](http://www.strath.ac.uk/chaplaincy)

The Chaplaincy Centre offers a welcome to all students. The atmosphere is relaxed and comfortable; the lounge is a great meeting point or a place to make new friends and the Ark Café offers great value for lunch. You can study in the library, have quiet contemplation or worship in the chapel, or just relax in the television room. The Chaplaincy is a place where people of different faith traditions can exchange ideas and learn from each other.

### CONTACT

**t:** +44 (0)141 548 4144

**e:** [chaplaincy@strath.ac.uk](mailto:chaplaincy@strath.ac.uk)

### MUSLIM STUDENTS' FACILITIES

There is a Muslim Students' Association representing the interests of the Islamic community at Strathclyde. Prayer rooms for men and women and space for other activities are provided in the lower level of the Chaplaincy building.

### CHILDCARE

For children under five there are childcare facilities, playgroups, nurseries and after-school care throughout the city. These can be very expensive and the Hardship Fund receives money from the UK government, which can be used by UK students with children who find it difficult to meet the cost of childcare. The funding does not extend to international students.

All children between the ages of 5 and 16 must attend school while they are in Glasgow. The children of all students (UK and non-UK) will be given places, at no cost, in a primary or secondary school in the area in which you are living. Contact the Head Teacher to check if there is a place available. In the case of non-UK students, the Head Teacher will assess your child's English language skills and make arrangements for them to be given assistance if required.

Childcare Scotland runs a nursery facility on campus for pre-school children on a paying basis. The nursery is very popular so it is advisable to check for availability of places (+44 (0)141 553 4125).



### DID YOU KNOW

Our Postgrad Community website offers you online communication, information and resources. For everything you need to know about postgrad life at Strathclyde, from events to training and career opportunities, visit: [www.strath.ac.uk/postgrad](http://www.strath.ac.uk/postgrad)

## Sports

### SPORTS UNION

[www.sportsunion.strath.ac.uk](http://www.sportsunion.strath.ac.uk)

Joining the Sports Union is a great way to meet people. The Sports Union provides competitive and recreational sport for the whole University community. It organises and coordinates the running of around 40 affiliated clubs and provides financial support, travel, coaching, equipment, catering and encouragement. All clubs cater for both the serious competitor and those who play just for fun, and all can offer tuition.

### CONTACT

**e:** [sportspresident@sportsunion.strath.ac.uk](mailto:sportspresident@sportsunion.strath.ac.uk)

### CENTRE FOR SPORT & RECREATION

[www.strath.ac.uk/sport](http://www.strath.ac.uk/sport)

The Centre for Sport & Recreation provides excellent facilities for a wide range of sports, as well as fitness classes, martial arts and weight training. There is a cardiovascular suite with more than 50 machines and a swimming pool, as well as facilities for outdoor sports such as football and hockey. Also available are fitness testing, health and lifestyle consultation, sports coaching classes and swimming and lifesaving classes. The Centre also provides facilities for many of the sports clubs run by the Students' Sports Union.

### CONTACT

**e:** [sport@strath.ac.uk](mailto:sport@strath.ac.uk)

### UNIVERSITY SPORTS BURSARIES

The University, in conjunction with Glasgow City Council, offers a number of Sports Bursaries each year to gifted athletes who wish to develop their sporting careers in conjunction with their academic studies. Bursaries, worth up to £1,000 each, are intended to help with costs such as coaching, competition travel and equipment. Bursars also enjoy additional sports science and lifestyle management support.

### CONTACT

Anne-Marie Hughes  
**t:** +44 (0)141 548 2449  
**e:** [a.m.hughes@strath.ac.uk](mailto:a.m.hughes@strath.ac.uk)

### GOLF BURSARIES

Royal and Ancient Golf Club Bursaries are available to full-time students on the basis of golfing merit. Each bursary is worth £1,500 annually and will be awarded for a maximum of four years, subject to satisfactory academic and golfing progress. A programme of coaching sessions to current Scottish Golf Union standards is an integral part of the Bursary Scheme.

### CONTACT

Niall Sturrock  
**t:** +44 (0)141 548 2782  
**e:** [n.sturrock@strath.ac.uk](mailto:n.sturrock@strath.ac.uk)

## Students' Association

[www.strathstudents.com](http://www.strathstudents.com)

Strathclyde Students' Association represents students both within the University and to the wider community. Facilities and activities on offer include bars, films, ceilidhs, comedy and band nights, access to over 40 sports clubs, 50 other clubs and societies, shop, bank, printing facilities, and more. There are many ways for you to become involved in the Union's activities, and this is a great way to meet like-minded people and make new friends.

In addition to the social events on offer, the Union offers a wide range of services and opportunities for students. Our Students' Association has spearheaded initiatives such as the Alternative Careers Fair, Green Week and the Booktrader Service and has won numerous awards for offering a safe and socially responsible environment. Postgraduate students have a dedicated social space within the Union.

The Students' Association operates its own Advice, Support and Knowledge service (ASK), a student-run, staff-supported facility where you can get help with academic appeals, financial problems and personal matters, as well as general enquiries. The Union's welfare team also administers a confidential Nightline Service staffed by trained student volunteers.

The Students' Association runs campaigns to improve the lives of students of all backgrounds especially those represented by the Union's liberation groups. These groups provide support for students and are a strong movement for challenging attitudes and pushing forward positive change.

Students play an important role in terms of the University's development, and there are opportunities to become involved in the Students' Association and as a Class Representative, participating in staff-student committees to discuss issues of relevance to students in your course. Visit the Students' Union website (see above) and see what's on offer and how you can get involved.

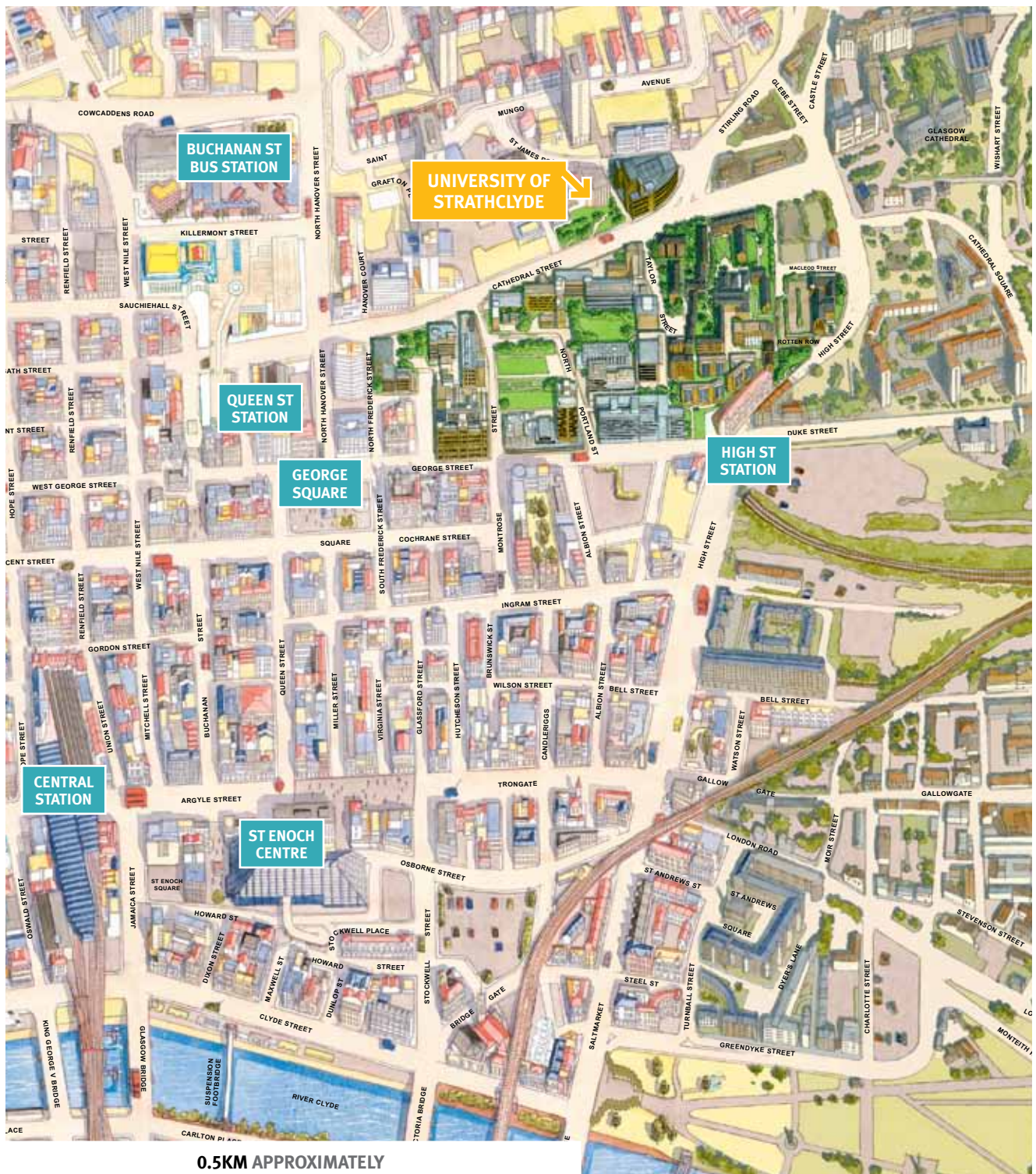


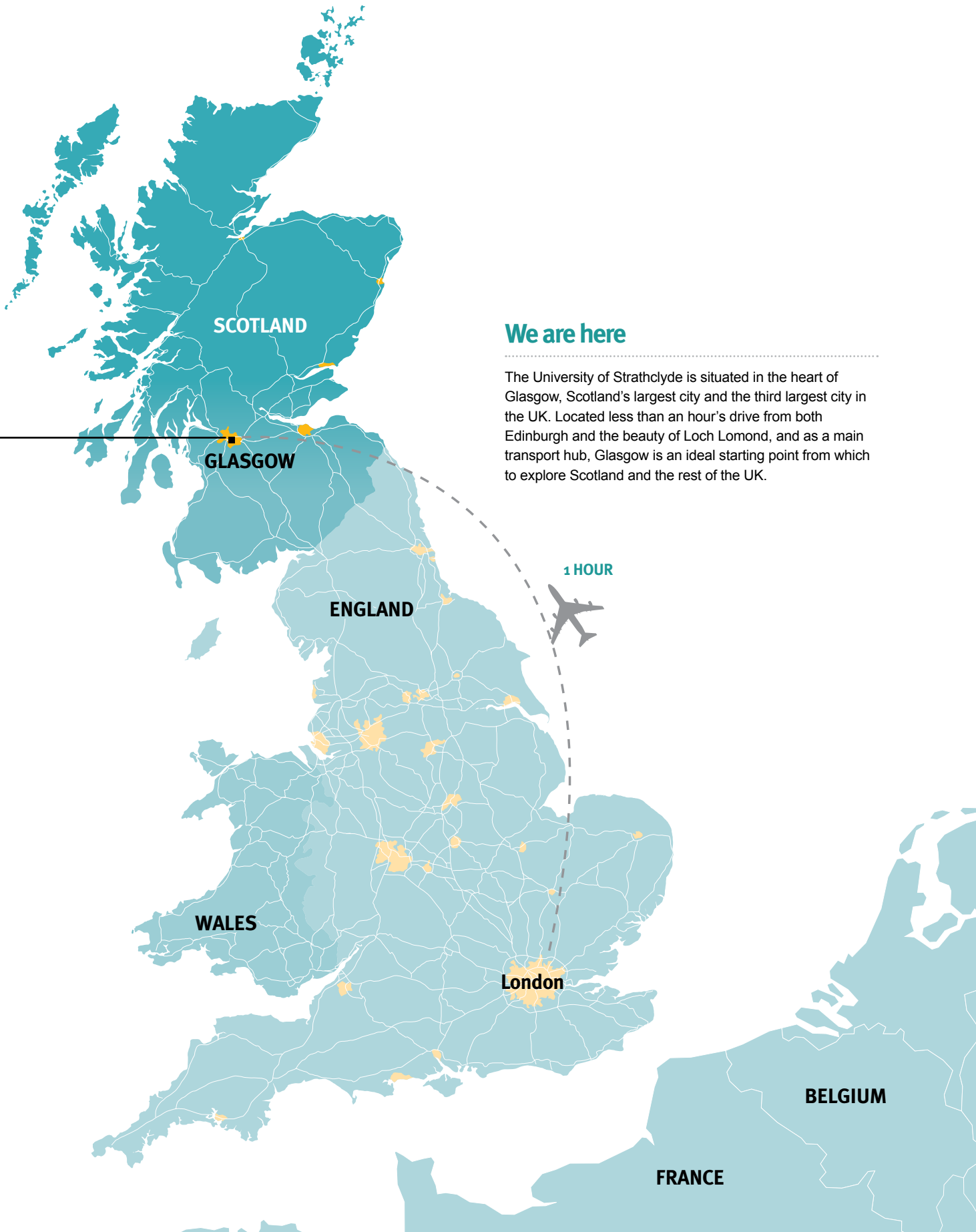
# Visiting

[www.strath.ac.uk/visiting](http://www.strath.ac.uk/visiting)

There are several ways to visit or find out more about the University. You can take a virtual campus tour on our website (see above), or you can visit the University. If you are based in the UK and would like to visit, contact [pg-enquiries@strath.ac.uk](mailto:pg-enquiries@strath.ac.uk) or +44 (0)141 548 2913.

If you are based outside of the UK, there may be a Strathclyde representative in your area. For information on overseas representatives, see [www.strath.ac.uk/rio/prospective](http://www.strath.ac.uk/rio/prospective) or, if you are in the UK and want to visit the University, contact [international@strath.ac.uk](mailto:international@strath.ac.uk) or +44 (0)141 548 2913.



**SCOTLAND****GLASGOW****ENGLAND****WALES****London****1 HOUR**

## We are here

The University of Strathclyde is situated in the heart of Glasgow, Scotland's largest city and the third largest city in the UK. Located less than an hour's drive from both Edinburgh and the beauty of Loch Lomond, and as a main transport hub, Glasgow is an ideal starting point from which to explore Scotland and the rest of the UK.

**BELGIUM****FRANCE**

## Course list

The following is a list of postgraduate taught courses offered at the University of Strathclyde.

Please see following page for index of courses included in this prospectus.

To download or request a copy of the prospectus for any of the other three Faculties, visit [www.strath.ac.uk/prospectus](http://www.strath.ac.uk/prospectus)

COURSE	DEGREE	COURSE	DEGREE
ADVANCED MANUFACTURE: TECHNOLOGY & SYSTEMS	MSc/PgDip/PgCert	EDUCATIONAL SUPPORT	MSc/PgDip/PgCert
ADVANCED MANUFACTURING: FORGING & FORMING	EngD	ELECTRICAL POWER ENGINEERING with BUSINESS	MSc
ANALYSIS of MEDICINES	MSc/PgDip	ELECTRONIC & ELECTRICAL ENGINEERING	MSc
ARCHITECTURAL DESIGN, ADVANCED	MArch/PgDip	ENGINEERING	MRes
ARCHITECTURAL STUDIES, ADVANCED	MSc/PgDip	ENVIRONMENTAL ENGINEERING	MSc
AUTOMATED PLANNING FOR AUTONOMOUS SYSTEMS	MRes	ENVIRONMENTAL ENTREPRENEURSHIP	MSc
AUTISM	MSc/PgDip/PgCert	ENVIRONMENTAL FORENSICS	MSc
BIOENGINEERING	MSc/PgDip/PgCert	ENVIRONMENTAL HEALTH	MSc
BIOMEDICAL ENGINEERING	MRes	ENVIRONMENTAL SCIENCE	MSc
BIOMEDICAL SCIENCES	MRes	EXECUTIVE COACHING	PgCert
BUILDING DESIGN & MANAGEMENT (Sustainable Engineering Programme)	MSc/PgDip/PgCert	FINANCE	MSc/PgDip
BUILDING DESIGN & MANAGEMENT FOR SUSTAINABILITY	MRes	FORENSIC SCIENCE	MSc/PgDip/PgCert
BUSINESS ADMINISTRATION, Master of	MBA	GENEALOGICAL, PALAEOLOGICAL & HERALDIC STUDIES	MSc/PgDip/PgCert
BUSINESS ADMINISTRATION, Doctor of	DBA	GEO-ENVIRONMENTAL ENGINEERING	MRes
BUSINESS ANALYSIS & CONSULTING	MSc/PgDip/PgCert	GEOTECHNICS	MSc
BUSINESS & MANAGEMENT, Master of	MSc/PgDip	GLOBAL INNOVATION MANAGEMENT	MSc
BUSINESS & MANAGEMENT, Research Methodology in	MRes/PgDip/PgCert	GLOBAL WATER SUSTAINABILITY	MSc
BUSINESS INFORMATION TECHNOLOGY SYSTEMS	MSc/PgDip	HEALTH HISTORY	MSc/PgDip/PgCert
CHARTERED TEACHER STUDIES	MSc/PgDip/PgCert	HIGH-POWER RADIO FREQUENCY SCIENCE & ENGINEERING	MSc/PgDip
CHEMICAL & PROCESS ENGINEERING, ADVANCED	MSc/PgDip/PgCert	HISTORICAL STUDIES	MSc/PgDip
CHEMICAL PROCESSING (Sustainable Engineering Programme)	MSc/PgDip/PgCert	HOSPITALITY & TOURISM LEADERSHIP	Executive Masters
CHEMICAL TECHNOLOGY & MANAGEMENT	MSc/PgDip/PgCert	HUMAN RESOURCE MANAGEMENT	MSc/PgDip
CLIMATE CHANGE ADAPTATION	MRes	HYDROGEOLOGY	MSc/PgDip
CLINICAL PHARMACY	MSc/PgDip	INFORMATION & LIBRARY STUDIES	MSc/PgDip
COACHING & MENTORING	MSc	INFORMATION MANAGEMENT	MSc/PgDip
COMMUNICATIONS, CONTROL & DIGITAL SIGNAL PROCESSING	MSc	INTERNATIONAL ACCOUNTING & FINANCE	MSc/PgDip
COMMUNICATIONS TECHNOLOGY & POLICY	MSc	INTERNATIONAL BANKING & FINANCE	MSc/PgDip
COMMUNITY CARE	MSc/PgDip/PgCert	INTERNATIONAL HOSPITALITY & TOURISM MANAGEMENT	MSc/PgDip
COMPUTER AIDED ENGINEERING DESIGN	MSc/PgDip/PgCert	INTERNATIONAL HUMAN RESOURCE MANAGEMENT	MSc/PgDip
COMPUTER SCIENCE, ADVANCED	MSc/PgDip	INTERNATIONAL LAW & SUSTAINABLE DEVELOPMENT	LLM/PgDip/PgCert
COUNSELLING	MSc/PgDip	INTERNATIONAL MANAGEMENT	MSc/PgDip
COUNSELLING PSYCHOLOGY	MSc/DPsych	INTERNATIONAL MARKETING	MSc/PgDip
COUNSELLING SKILLS	PgCert	INTERNET LAW & POLICY	LLM/PgDip/PgCert
CREATIVE WRITING	MRes	INVESTMENT & FINANCE	MSc/PgDip
DIGITAL CREATIVITY	MSc/PgDip/PgCert	JOURNALISM	MLitt/PgDip
DIGITAL MULTIMEDIA & COMMUNICATION SYSTEMS	MSc	JOURNALISM, INVESTIGATIVE	MSc/PgDip
DRUG DELIVERY SYSTEMS/with INTERNATIONAL PLACEMENT	MRes	JOURNALISM, LITERARY	MLitt/PgDip
EARLY CHILDHOOD STUDIES	MSc/PgDip/PgCert	LAW, GRADUATE ENTRY	LLB
ECONOMIC MANAGEMENT & POLICY	MSc	LAW, CONSTRUCTION	LLM/PgDip
EDUCATION	EdD/MEd	LAW, HUMAN RIGHTS	LLM/PgDip/PgCert
EDUCATIONAL RESEARCH, APPLIED	MSc/PgDip	LAW, INTERNATIONAL ECONOMIC	LLM/PgDip/PgCert
		LAW (Pre-qualification Courses)	



COURSE	DEGREE
LITERATURE, CULTURE & PLACE	MLitt/PgDip/PgCert
MANAGEMENT	Masters
MANAGEMENT & LEADERSHIP in EDUCATION	MSc/PgDip/PgCert
MARINE ENGINEERING	MSc/PgDip
MARINE TECHNOLOGY (Sustainable Engineering Programme)	MSc/PgDip/PgCert
MARKETING	MSc/PgDip
MECHANICAL ENGINEERING, ADVANCED	MSc/PgDip/PgCert
MECHATRONICS & AUTOMATION	MSc/PgDip/PgCert
MEDIATION & CONFLICT RESOLUTION	MSc/PgDip/PgCert
MEDICAL DEVICES	EngD/ MSc/PgDip/PgCert
MEDICAL TECHNOLOGY	MRes
NANOSCIENCE	MSc/PgDip
NORTH ATLANTIC WORLD, c900-c1800	MSc/PgDip
OFFSHORE FLOATING SYSTEMS	MSc/PgDip
OFFSHORE RENEWABLE ENERGY (Sustainable Engineering Programme)	MSc/PgDip/PgCert
OPERATIONAL RESEARCH	MSc/PgDip/PgCert
OPERATIONS MANAGEMENT in ENGINEERING	MSc/PgDip/PgCert
OPTICAL TECHNOLOGIES	MSc/PgDip
OPTICS & PHOTONICS TECHNOLOGIES	EngD
PHARMACEUTICAL ANALYSIS	MSc/PgDip
PHARMACEUTICAL QUALITY & GOOD MANUFACTURING PRACTICE	MSc/PgDip
PHILOSOPHY WITH CHILDREN	PgCert
PHOTONICS & DEVICE MICROFABRICATION	MSc/PgDip
POLITICAL RESEARCH	MSc
POLLUTION PREVENTION CONTROL, INTEGRATED	MRes
POWER PLANT TECHNOLOGIES/ENGINEERING	MSc/PgDip/PgCert
PRIMARY EDUCATION	PGDE (Primary)
PROCESS TECHNOLOGY & MANAGEMENT	MSc/PgDip/PgCert
PRODUCT ENGINEERING DESIGN	MSc/PgDip/PgCert
PROFESSIONAL LEGAL PRACTICE	Diploma
PROFESSIONAL STUDIES, ADVANCED	MSc/PgDip/PgCert
PSYCHOLOGY, EDUCATIONAL	DEdPsy/MSc
PSYCHOLOGY, RESEARCH METHODS in	MRes
PUBLIC POLICY	MSc
PUBLIC POLICY, EUROPEAN	MSc
PUBLIC POLICY, INTERNATIONAL	MSc
QUANTUM INFORMATION & COHERENCE	MSc/PgDip
REHABILITATION STUDIES	MSc
RENEWABLE ENERGY SYSTEMS & the ENVIRONMENT (Sustainable Engineering Programme)	MSc/PgDip/PgCert
RESIDENTIAL CHILDCARE, ADVANCED	MSc/PgDip/PgCert
SAFETY & RISK MANAGEMENT	MSc/PgDip/PgCert
SECONDARY EDUCATION	PGDE (secondary)

Our course list is available online at:  
[www.strath.ac.uk/courses/postgraduate](http://www.strath.ac.uk/courses/postgraduate)

Why not visit our postgraduate community website at:  
[www.strath.ac.uk/postgrad](http://www.strath.ac.uk/postgrad)

COURSE	DEGREE
SHIP & OFFSHORE STRUCTURES	MSc/PgDip
SHIP & OFFSHORE TECHNOLOGY	MSc/PgDip
SOCIAL HISTORY	MSc/PgDip
SOCIAL WORK	Master/PgDip
SOCIAL WORK MANAGEMENT	MSc/PgDip/PgCert
SUBSEA ENGINEERING	MSc/PgDip
SUPPLY CHAIN & OPERATIONS MANAGEMENT/ LOGISTICS MANAGEMENT/PROCUREMENT MANAGEMENT	MSc/PgDip/PgCert
SUPPORTING BILINGUAL LEARNERS	PgCert
SUSTAINABLE ENGINEERING, Faculty Programme in	MSc/PgDip/PgCert
SUSTAINABLE PRODUCT DEVELOPMENT (Sustainable Engineering Programme)	MSc/PgDip/PgCert
SUSTAINABILITY & ENVIRONMENTAL STUDIES	MSc
TECHNICAL SHIP MANAGEMENT	MSc/PgDip
URBAN DESIGN	MSc/PgDip/PgCert

## Terms and Conditions of Matriculation

All students will be required as a condition to abide by and to submit to the procedures and rules of the University's Statutes, Ordinances, and Regulations as found in the University Calendar, as amended from time to time. A copy of the Calendar is available, on request, from the University or may be downloaded from the link at [www.strath.ac.uk/corporateservices/gmp/academicaffairs](http://www.strath.ac.uk/corporateservices/gmp/academicaffairs)

The University will use all reasonable endeavours to deliver courses in accordance with the descriptions set out in this Prospectus. Matters such as industrial action and the death or departure of staff may adversely affect the ability of the University to deliver courses in accordance with the descriptions. Also, the University has to manage its funds in a way which is efficient and cost-effective, in the context of the provision of a diverse range of courses to a large number of students.

The University therefore:

- reserves the right to make variations to the contents or methods of delivery of courses, to discontinue courses and to merge or combine courses, if such action is reasonably considered by the University in the context of its wider purposes. If the University discontinues any course, it will use its reasonable endeavours to provide a suitable alternative course.
- cannot accept responsibility, and expressly excludes liability, for damage to students' property, transfer of computer viruses to students' equipment, and changes to teaching arrangements and similar activities.

This Prospectus, published August 2011, is for use by those interested in entering the University in the academic year beginning in September 2011. The contents of the Prospectus are as far as possible up-to-date and accurate at the date of publication. Changes are made from time to time and the University reserves the right to add, amend or withdraw courses and facilities, to restrict student numbers and to make any other alterations as it may deem necessary and desirable. The descriptions of courses in this Prospectus are intended as a useful guide to applicants and do not constitute the official regulations which are available in the current edition of the University Calendar.

A guide to the admission requirements for the University's degree courses is given in each course entry, but please consult the University website for the most up-to-date information.

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# Campus Map



## Key

- |    |   |    |  |
|----|---|----|--|
| 1  | McCance Building                            | 18 | John Anderson Building   |
| 2  | Livingstone Tower                           | 19 | Chancellors Hall   |
| 3  | Graham Hills Building                       | 20 | James Blyth Court/Thomas Campbell Court                              |
| 4  | Royal College Building                      | 21 | James Young Hall   |
| 5  | James Weir Building                         | 22 | Forbes Hall  |
| 6  | Thomas Graham Building                      | 23 | James Goold Hall   |
| 7  | Centre for Sport & Recreation               | 24 | Murray Hall  |
| 7a | Chaplaincy/St Paul's Building (not in view) | 25 | Campus Village Office  |
| 7b | Student Union (not in view)                 | 26 | Garnett Hall   |
| 8  | Rottenrow Gardens                           | 27 | Birkbeck Court   |
| 9  | Colville Building                           | 28 | Barony Hall  |
| 10 | Architecture Building                       | 29 | Andrew Ure Hall  |
| 11 | Sir William Duncan Building                 | 30 | Patrick Thomas Court   |
| 12 | Strathclyde Business School                 | 31 | Henry Dyer Building  |
| 13 | Stenhouse Building                          | 32 | Collins Building / Collins Gallery                                   |
| 14 | Arbuthnott Building                         | 33 | Ramshorn Theatre   |
| 15 | Wolfson Building                            | 34 | The Strathclyde Institute of Pharmacy and Biomedical Science (SIPBS) |
| 16 | Curran Building                             |    |  |
| 17 | Lord Hope Building (not in view)            |    |  |