



THE UNIVERSITY
of EDINBURGH

THE UNIVERSITY
OF EDINBURGH
Engineering
POSTGRADUATE
OPPORTUNITIES

2016 ENTRY

THE UNIVERSITY OF EDINBURGH: INFLUENCING THE WORLD SINCE 1583

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“You are now in a place where the best courses upon Earth are within your reach . . . such an opportunity you will never again have.”

Thomas Jefferson, American Founding Father and President (speaking to his son-in-law, Thomas Mann Randolph, as he began his studies at Edinburgh in 1786)

The University

Our proud history and alumni ambassadors

For more than 400 years our staff and students have been making their mark on the world. They've explored space, revolutionised surgery, won Nobel Prizes, published era-defining books, run the country, paved the way for life-saving breakthroughs and laid the foundations for solving the mysteries of the universe. By choosing further study or research at Edinburgh you will be joining a community of scholars who have been at the forefront of knowledge since 1583.

We are associated with 20 Nobel Prize winners, including physicists Peter Higgs, Charles Barkla and Max Born, medical researcher Peter Doherty, economist Sir James Mirrlees and biologist Sir Paul Nurse. Our distinguished alumni include NASA astronaut Piers Sellers, former MI5 Director-General Dame Stella Rimington, Olympians Sir Chris Hoy and Katherine Grainger and historical greats such as philosopher David Hume, physicist and mathematician James Clerk Maxwell, inventor Alexander Graham Bell and Sherlock Holmes creator Sir Arthur Conan Doyle.

Teaching and research excellence

We are consistently ranked as one of the world's top 50 universities. We are 17th in the 2014/15 QS World University Rankings. As host to more than 30,000 students from some 137 countries, studying across 100 academic disciplines, the University of Edinburgh continues to attract the world's greatest minds. In the Research Excellence Framework (REF) 2014, 83 per cent of our research was judged world-leading or internationally excellent. We're ranked fourth in the UK for research power, based on the quality and breadth of our research. Our excellent teaching was also confirmed in the latest report from the Quality Assurance Agency, which awarded us the highest rating possible for the quality of the student learning experience.

Collaborations and international partnerships

As an internationally renowned centre of academic excellence, Edinburgh is the site of many world-class research collaborations. Our postgraduate students are crucial to our continued success and development and, along with our staff, they forge research links through regular travel and overseas exchanges. We take pride in our partnerships with other institutions such as the California Institute of Technology (Caltech), Stanford University, the University of Melbourne, Peking University, the University of Delhi

and the University of KwaZulu-Natal – to name but a few. We are a member of both the League of European Research Universities and the Coimbra Group, giving us strong links with leading European institutions from Barcelona to Berlin.

Linking research and commerce

Edinburgh was one of the first UK universities to actively develop commercial links with industry, government and the professions. Edinburgh Research and Innovation (ERI) has continued, for the past four decades, to develop the promotion and commercialisation of the University's research excellence. ERI assists our postgraduates in taking a first step to market, whether it is through collaborative research, licensing technology or providing consultancy services.

Enhancing your career

We're ranked 18th in the world for the employability of our graduates.* With one of the best track records for graduate employment in the Russell Group, we are committed to embedding employability into your teaching and learning experience. From offering access to volunteering schemes to providing support from our sector-leading Careers Service, the University provides myriad opportunities to develop your skills, knowledge and experience giving you the edge in a competitive job market.

An inspiring destination

Your first-class education will take place in one of Europe's most striking capital cities, a UNESCO World Heritage Site that is regularly voted one of the best places in the world to live. Edinburgh enjoys a solid reputation as a centre for innovation, whether as home to the 18th-century Scottish Enlightenment, as a modern source of pioneering science, medicine and technology, or as the host of the world's largest and longest-established arts festival. You couldn't ask for a more inspiring setting in which to further your knowledge and broaden your horizons.

Join us

Edinburgh offers unparalleled academic breadth and diversity, making it a vibrant, challenging and stimulating environment for postgraduate study. Whether you plan to change direction, enhance your existing career or develop in-depth knowledge of your area of study, the University of Edinburgh provides a world-class learning experience.

* Latest Emerging Global Employability University Rankings

WELCOME TO THE SCHOOL OF ENGINEERING

Our School is a hotbed of innovation. In the 2014 Research Excellence Framework (REF), 94 per cent of our research activity was rated world-leading or internationally excellent. We have a strong track record of producing technology spin outs and we develop industry links to help you build relationships that will last your whole career.

We have six specialist research institutes:

Bioengineering

The Institute for Bioengineering is a vibrant group with interests including biosensing, tissue engineering, biomedical measurement, modelling and applications. We're developing innovative diagnostic, therapeutic and real-time monitoring biomedical devices and technologies. We demonstrated the first ex vivo and in vivo probing of mechanical characteristics of prostate cancer for monitoring disease progression. Our IMPACT (Implantable Microsystems for Personalised Anti-Cancer Therapy) project will use miniature wireless sensors for minute-to-minute monitoring of individual tumours. Both projects are in collaboration with clinicians from the Western General Hospital, Edinburgh, and funded by the Engineering and Physical Sciences Research Council.

Digital communications

The Institute for Digital Communications pioneers new theories and techniques in the fields of signal processing, imaging and communications, technologies that have come to power the global economy. Among recent highlights, Professor Harald Haas' 'Li-fi' system of lightbulb-based wireless communication was named among the world's top inventions by *Time* magazine.

Energy systems

The Institute for Energy Systems helps shape tomorrow's difficult energy decisions. It continues a long line of world-leading innovation by Edinburgh researchers, from the 1970s 'Duck' wave energy converter, invented by Stephen Salter – now Emeritus Professor of Engineering Design – to direct-drive electrical generators, wave-generation technology and hydraulic transmission systems. Our research covers machinery, electronics, power distribution,

marine energy including offshore wind generation, climate change impact assessment and policy development.

Infrastructure and environment

The Institute for Infrastructure and Environment shapes the development of better technologies to improve the built and natural environments. It hosts the world-leading Building Research Establishment (BRE) Centre for Fire Safety Engineering and outstanding activities in environmental engineering, bulk materials handling, high-speed rail, non-destructive testing, design, performance, resilience and regulation of structures and systems.

Integrated micro and nano systems

The Institute for Integrated Micro and Nano Systems' research encompasses integrated circuit design, system-on-chip design, microfabrication, micro-electro-mechanical systems (MEMS), micro-machining and neural computation. Research themes include materials and structures, optical systems and materials, sensors, smart MEMS technology, and smart wireless devices and systems.

Materials and processes

The Institute for Materials and Processes produces world-class research to advance engineering applications of materials, fluids and processes, in a high-quality and creative research environment. We use experimental, computational and theoretical methods to shed light on the underlying engineering science. Our research tackles societal challenges, from reducing CO₂ emissions, to sustainable energy, clean water and medical diagnostics and therapeutics. Research themes include carbon capture and separation, multiscale modelling, multiphase flows and transport phenomena, and materials design and characterisation.



Facilities and resources

From supercomputing to structural testing, the facilities for your postgraduate studies at the School of Engineering are among the best in the world.

We have computing facilities unique to the UK, including the Edinburgh Parallel Computing Centre (EPCC), a leading European centre for research, and the silicon fabrication capabilities of the Scottish Microelectronics Centre (SMC), which also has extensive 'class 10' cleanrooms, and provides rare access to tools for processing 200mm silicon wafers. The SMC has strong links with industry and spin-out activity, generating annual turnover of more than £1 million.

Extensively equipped

The BRE Centre for Fire Safety Engineering hosts bespoke equipment to support groundbreaking research and consultancy with precisely controlled high temperatures and the latest image analysis techniques. The recently refurbished Structures Test Hall is our high-headroom lab for testing large and unusual assemblies. We have state-of-the-art lab facilities for developing and testing non-destructive evaluations and material-handling technologies. We also have a smart infrastructure lab and a good range of environmental engineering testing resources for the water and waste management sectors.

New investment

Our £6.5 million Industrial Doctorate Centre in Offshore Renewable Energy is a new facility that will train 50 engineering doctorate students over nine years in all aspects of offshore renewable energy. The University's leadership in low carbon energy has been further enhanced by a £9 million investment in the FloWave Ocean Energy Research Facility for wave and tidal devices.

Students of biomechanics have access to the best medical imaging facilities in Europe, the Clinical Research Imaging Centre at the Royal Infirmary of Edinburgh, through a major collaboration between the University and the National Health Service.

In addition to outstanding University-based resources, postgraduate programmes use visits to external sites and facilities to gain research data and to contextualise learning.

Collections of the University

The University's collections are unique in their depth and diversity. Managed by the Centre for Research Collections, and housed in our Main Library at the heart of our central campus, they span more than 500,000 rare books, scientific and cultural artefacts from around the world, historically significant musical instrument collections, specialist museum collections, and manuscripts.

Highlights include the world's oldest surviving Gaelic text; a page from the final draft of Charles Darwin's *On the Origin of Species*, as well as two copies of the first edition; Adam Smith's original library; Alexander Fleming's sample of mould used to make penicillin; original quartos of Shakespeare plays, with notes in the margins from 16th-century actors; the thermometer of chemist Joseph Black; and original Sir Isaac Newton diagrams in David Gregory manuscripts of 1692.

University archivists – with a broad spectrum of expertise – make it their priority to ensure these items are accessible by our students, researchers and staff.

We have a £6.5 million
Industrial Doctorate Centre
in Offshore Renewable Energy.

Community

Our graduate community is large and diverse, composed of 100 academics and more than 350 postgraduate students representing more than 50 nationalities. Our research spans a wide spectrum of modern engineering and we are equipped with state-of-the-art resources, keeping us at the forefront of our research fields.

The School of Engineering is a partner in a number of interdisciplinary centres, based both within and beyond the University, from which postgraduate research students can derive additional expertise. These include:

- UK Centre for Carbon Capture and Storage
- Centre for Biomedical Engineering at Edinburgh
- Centre for Materials Science and Engineering
- Centre for Science at Extreme Conditions
- Scottish Mechanotransduction Consortium
- Edinburgh Materials Microanalysis Centre.

In addition, postgraduate students can draw on the unique Edinburgh Research Partnership in Engineering and Mathematics (ERPem), a research consortium involving the University of Edinburgh, Heriot-Watt University and Edinburgh Napier University.

More information:
www.erp.ac.uk

Hall of fame

From telephone inventor Alexander Graham Bell to geologist James Hutton, the University of Edinburgh has produced many leading lights in the field of science and engineering.

By joining our School you will follow in the footsteps of some of engineering's most pioneering individuals. Our staff, students and alumni have a long tradition of making a vital contribution to contemporary living. Inventor of the cable car Fleeming Jenkin was Professor of Engineering at the University during the 19th century, and William Rankine, a key contributor to the science of thermodynamics, was educated at Edinburgh.

In more recent times, the late Sir James Hamilton – one of our graduates – was responsible for the wing design on aviation icon Concorde. Professor Stephen Salter, who is based at the School as an Emeritus Professor, is widely considered a pioneer in the field of wave energy, while Harald Haas, Chair of Mobile Communications, has attracted international interest with his 'Li-fi' invention. He was named one of the UK's 10 RISE leaders in the Engineering and Physical Sciences Research Council's 2014 awards Recognising Inspirational Scientists and Engineers.

Our entrepreneurial engineers have also made significant contributions to modern gadgets, such as the iPod and the camera phone. The Institute for Integrated Micro and Nano Systems (IMNS) holds the world record for producing the smallest colour TV screen – just 3.84x2.88mm.

By joining our School you will follow in the footsteps of some of engineering's most pioneering individuals.

Employability and graduate attributes

With our excellent employability record and international reputation, the University of Edinburgh is a strong choice for developing your engineering career. Whether you are looking to make your mark in industry, consultancy or academia, or develop a business venture of your own, we offer a number of services to help you fulfil your ambitions and make the most of your time here.

Institute for Academic Development

All of our postgraduate students can benefit from the University's Institute for Academic Development (IAD), which provides information, events and courses to develop the skills you will need throughout your studies and in the future.

Further information is available online:
www.ed.ac.uk/iad/postgraduates

For taught postgraduates, the IAD provides a growing range of tailored study-related and transferable skills workshops, plus online advice and learning resources. These are all designed to help you settle into postgraduate life, succeed during your studies, and move confidently to the next stage of your career.

The IAD also offers one of the longest-established researcher development training packages in the UK. Our experts will help you gain the skills, knowledge and confidence needed to move on to the next stage in your career, be that in academia or beyond.

The Institute provides research students with dedicated training in topics such as research management; personal effectiveness; communication skills; public engagement, networking and teamworking; leadership; and career management. You can gain expertise in information technology and presentation skills; confidence in undertaking independent and creative research; the ability to critically evaluate source materials; and the capacity to construct intellectually rigorous arguments. By developing these broader professional skills and qualities, our postgraduate students are always in high demand.

Careers Service

The University's award-winning Careers Service aims to expand the horizons of all our students, empowering you to make successful career decisions. It works closely with the University's Employability Consultancy to support students to take advantage of every opportunity to enhance your employability while studying.

The Service provides specialist support for postgraduate students to help with career planning and decision making. Its team of friendly experts can support you to explore different career options, identify your skills and what you want out of a career, think about effective job search strategies, and prepare for job applications and interviews.

The Service has a team dedicated to developing our already strong links with employers from all industries and employment sectors; from the world's top recruiters to small enterprises based here in Edinburgh. The team provides a programme of opportunities for students to meet employers on campus and virtually, and advertises a wide range of part-time and graduate jobs.

More information:
www.ed.ac.uk/careers/postgrad

Connect.ed

Edinburgh encourages its alumni to stay in touch with current students who are interested in a similar career path. Connect.ed is a networking system run by the Careers Service that provides a confidential opportunity for alumni to share their occupational knowledge and experience with current students, who can contact them for advice and guidance on their future career.

More information:
www.ed.ac.uk/careers/connected

Backing bright ideas

LAUNCH.ed is the University's award-winning programme for student entrepreneurs. Each year, LAUNCH.ed works with hundreds of students to assess their ideas and develop their business skills and helps many start their businesses. We have helped Edinburgh students and alumni launch almost 100 new businesses in the last three years, ranging from language tuition to robotics companies.

More information:
www.LAUNCH.ed.ac.uk

Research support

We encourage our researchers to gain experience and skills through presenting research via formal outlets such as journals or conferences throughout the duration of your programme. Research students may also have access to courses offered by other organisations such as the EPSRC.

Leading light

One of our latest and most exciting spin-out companies has pioneered fast wireless data streaming using lightbulbs.
www.purelifi.co.uk



Taught masters programmes

Following a taught Master of Science (MSc) programme will typically mean that you take two semesters of taught courses, followed by a research project for which you will write a dissertation.

www.ed.ac.uk/pg/799

Bioelectronics & Biosensors

MSc 1 yr FT

Programme description

Bioelectronic and biosensor technology exists at the interface between electronics engineering and the science of bioanalytical chemistry. An understanding of bioelectronics is important for the study of biomolecules, cells and organisms, particularly their electronic/ionic properties and behaviour. The application of this knowledge in the creation of biosensors is currently driving a revolution in biomedicine through the development of advanced diagnostic techniques that can be used at the point of care.

This MSc aims to provide the next generation of researchers and innovators with the skills and knowledge to succeed in this challenging and fast-moving field. Edinburgh's position at the forefront of research in engineering, chemistry and medicine means that students have access to academics and researchers with state-of-the-art knowledge. Much of this research is of an interdisciplinary nature and so there is a need for researchers and technologists who are able to bridge the gaps between these different disciplines and communicate across boundaries.

Programme structure

This programme runs over 12 months, with two semesters of taught courses followed by a research project and a dissertation.

SEMESTER 1 COURSES

Introduction to Bioelectronics; Biosensors; Chemistry for Life Sciences; Introduction to Analogue Electronics; Concepts and Techniques in Bioanalytical Chemistry.

SEMESTER 2 COURSES

Biophysical Chemistry; Biosensors and Instrumentation; Lab-on-Chip Technologies; Biomedical Imaging Techniques; Microfabrication Techniques.

Career opportunities

With our excellent employability record and international reputation, the University of Edinburgh is a reliable choice for developing your engineering career. Graduates will be prepared to work as interdisciplinary research engineers or scientists solving problems at the boundary between the physical and the life sciences, or to pursue advanced degrees in a wide range of subjects from engineering to medicine.

Minimum entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/country), in engineering, chemistry or another relevant physical science.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Programme contact MSc Administrator
Tel +44 (0)131 650 7352
Email pgtenquiries@eng.ed.ac.uk

www.ed.ac.uk/pg/669

Electronics

MSc 1 yr FT

Programme description

This programme offers distinct specialisation areas in electronics: analogue VLSI design, bioelectronics and analogue and digital systems.

In analogue VLSI design, our facilities include a unique custom designed analogue integrated circuit specifically designed to support laboratory based teaching. Our advanced design and prototyping laboratories, advanced micro and nano fabrication facilities and state-of-the-art digital system laboratories use the latest industry standard software tools.

Alternatively, students may specialise in the emergent discipline of bioelectronics where our research and teaching interests include access to the fabrication facilities at the Scottish Microelectronics Centre.

For students who wish to study a more general electronics programme including digital systems, a prescribed course selection is available.

Programme structure

This programme is run over 12 months, with two semesters of taught courses, including a small number of options, followed by a research project, leading to a masters thesis.

SEMESTER 1 COURSES

Analogue IC Design; Analogue VLSI A; Discrete-Time Signal Analysis; Power Electronics; Principles of Microelectronic Devices; Digital Systems Laboratory A; Introduction to Bioelectronics; Biosensors.

SEMESTER 2 COURSES

Digital System Design; Digital Systems Laboratory; Research Project Preparation; Electronic/Electrical Engineering System Design; Analogue VLSI B; Sigma Delta Converters; Analogue Circuit Design; Microfabrication Techniques; Biosensors and Instrumentation; Lab-on-Chip Technologies; Biomedical Imaging Techniques; Embedded Mobile and Wireless Systems; Modern Economic Issues in Industry; Technology and Innovation Management.

Career opportunities

You will gain practical experience in analogue and digital laboratories and become familiar with the latest industry standard design software and environments. Having been exposed to concepts such as design re-use and systems on chip technology, you will be able to cooperate with others in electronic system design.

Minimum entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/country), in electronics or electrical engineering. Any appropriate professional experience will also be considered.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Programme contact MSc Administrator
Tel +44 (0)131 650 7352
Email pgtenquiries@eng.ed.ac.uk

www.ed.ac.uk/pg/806

International Master of Science in Fire Safety Engineering

MSc 2 yrs FT

Programme description

This is a two-year programme in the Erasmus Mundus framework, coordinated by Ghent University, Belgium, in partnership with Lund University, Sweden, and the University of Edinburgh.

Classes in Edinburgh focus on fire dynamics, fire safety engineering and structural design for fire. Classes in Ghent have a more general fire safety engineering focus and classes in Lund emphasise enclosure fire dynamics, risk analysis and human behaviour. Our Building Research Establishment (BRE) Centre for Fire Safety Engineering hosts bespoke equipment to support groundbreaking research and teaching, with combined thermal and mechanical loading and use of the latest image analysis techniques.

Programme structure

The four semesters are each worth 30 European Credit Transfer and Accumulation System (ECTS) credits. Changing study location after each semester lets you benefit from the expertise of each university.

SEMESTER 1

Students choose to study at either Ghent or Edinburgh.

Ghent University: *Language and Culture* (this course is given two weeks before the start of the academic year); *Introduction to Fire Dynamics; Basics of Structural Engineering; Thermodynamics, Heat and Mass Transfer.*

University of Edinburgh: *Fire Science and Fire Dynamics; Fire Safety Engineering; Fire Investigation and Failure Analysis; Engineering Project Management.*

SEMESTER 2

Lund University: *Advanced Fire Dynamics; Human Behaviour in Fire; Risk Assessment; Simulation of Fires in Enclosures.*

SEMESTER 3

Students choose to study at either Ghent or Edinburgh.

Ghent University: *Active Fire Protection I: Detection and Suppression; Active Fire Protection II: Smoke and Heat Control; Explosions and Industrial Fire Safety; Fire Safety Regulation; Passive Fire Protection; Performance-Based Design.*

University of Edinburgh: *Fire Safety Engineering; Fire Science Laboratory; Structural Design for Fire; Finite Element Analysis for Solids.*

SEMESTER 4

The masters thesis is supervised by at least one of the partner universities.

Career opportunities

We aim to train the next generation of leaders in this field. There is great demand for fire safety engineers worldwide and as a graduate you will have gained relevant employment or enhanced career opportunities.

Minimum entry requirements

A UK undergraduate degree, or its international equivalent (www.ed.ac.uk/international/country), in civil, structural, mechanical, electrical, chemical or industrial engineering; material sciences; chemistry; physics; applied physics; architecture; urbanism and spatial planning or a related discipline.

English language requirements

See page 17.

Fees and funding

www.imfse.ugent.be
For funding information see also page 18.

Programme contact Lies Decroos (IMFSE Administrator)
Tel +32 9 264 98 47
Email imfse@ugent.be

www.ed.ac.uk/pg/882

Sensor & Imaging Systems

MSc 1 yr FT

Programme description

This programme is run jointly by the universities of Edinburgh and Glasgow. It focuses on the principles, methods, techniques and technologies that underpin a vast range of needs in applications spanning research, industry and medicine. Sensing and sensor systems are essential for advances in research across all fields of physics, engineering and chemistry and can be enhanced when multiple sensing functions are combined into arrays to enable imaging.

Industrial applications of sensor systems are ubiquitous: from mass-produced sensors found in modern smartphones and cars to the state-of-the-art, specialist high-value sensors routinely used in oil and gas recovery, scientific equipment, machine tools, medical equipment and environmental monitoring.

Programme structure

This programme is run over 12 months. The first semester of taught courses is run at the University of Glasgow and the second at the University of Edinburgh, followed by a research project, carried out at either university, leading to a masters thesis.

SEMESTER 1

University of Glasgow: *Sensing and Imaging; Imaging and Detectors; Detection and Analysis of Ionising Radiation; Circuits & Systems;* Option course in physics or engineering.

SEMESTER 2

University of Edinburgh, two compulsory courses: *Applications of Sensor and Imaging Systems; Research Project Preparation.*

Two option courses in engineering and/or chemistry, e.g. *Biophysical Chemistry; Biosensors and Instrumentation; Lab-on-Chip Technologies; Biomedical Imaging Techniques; Microfabrication Techniques.*

Career opportunities

Sensor and imaging systems underpin a vast range of societal, research and industrial needs. This is an industry-focused programme, designed for students looking to develop the skills and knowledge that will open up opportunities in the many companies developing sensor and image based solutions.

Minimum entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/country), in engineering, physics, chemistry or another relevant physical science. Applicants with backgrounds in other fields may be accepted.

English language requirements

See page 17.

Fees and funding

Prestigious Scottish Funding Council (SFC) awards are available to high calibre applicants for this programme. The SFC has selected this programme in recognition of the high demand for students with such qualifications. The awards cover all tuition costs; for further information see www.ed.ac.uk/student-funding/postgraduate and also page 18.

Programme contact Postgraduate Admissions Team
Tel +44 (0)141 330 4515
Email pgadmissions@glasgow.ac.uk

www.ed.ac.uk/pg/20

Signal Processing & Communications

MSc 1 yr FT (2 yrs PT available for UK/EU students)

Programme description

This programme provides graduates and working professionals with a broad training in signal processing and communications. It is suitable for recent graduates who wish to develop the specialist knowledge and skills relevant to this industry and is also suitable as advanced study in preparation for research work in an academic or industrial environment or in a specialist consultancy organisation. Engineers or other professionals wishing to participate in the MSc programme may do so on a part-time basis.

Our students gain a thorough understanding of theoretical foundations as well as advanced topics at the cutting edge of research in signal processing and communications, including compressive sensing, deep neural networks, wireless communication theory, and numerical Bayesian methods. The MSc project provides a good opportunity for students to work on state-of-the-art research problems in signal processing and communications.

Programme structure

This programme is run over 12 months, with two semesters of taught courses followed by a research project leading to a masters thesis.

SEMESTER 1 COURSES

Discrete-Time Signal Analysis; Digital Communication Fundamentals; Probability, Random Variables and Estimation Theory; Statistical Signal Processing; Image Processing; Signal Processing Laboratory.

SEMESTER 2 COURSES

Adaptive Signal Processing; Advanced Coding Techniques; Advanced Wireless Communication; Array Processing Methods; Advanced Concepts in Signal Processing; Pre-dissertation project preparation and report.

Career opportunities

With our excellent employability record and international reputation, the University of Edinburgh is a reliable choice for developing your engineering career. This programme will appeal to graduates who wish to pursue a career in an industry such as communications, radar, medical imaging or anywhere else signal processing is applied.

Minimum entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/country), typically in electrical engineering with a specialisation in signal processing and/or communications. Applications from related fields such as computer science, physics or mathematics will also be considered. Entry into this high-level programme is competitive and high grades are expected in fundamentals such as mathematics, signals and systems, probability and statistics, and communications and signal processing.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Programme contact MSc Administrator

Tel +44 (0)131 650 7352

Email pgtenquiries@eng.ed.ac.uk

www.ed.ac.uk/pg/423

Structural & Fire Safety Engineering

MSc 1 yr FT

Programme description

Innovative design allows more interesting and functional architecture but challenges traditional concepts of fire safety. To respond to these demands takes specialist knowledge and advanced skills in engineering analysis. This programme covers the fundamentals of fire science, including laboratory classes, fire safety engineering and relevant structural engineering topics, such as finite element methods.

You will gain knowledge of the critical issues in structural fire safety engineering, and an understanding of relevant fire and structural behaviours. You will become familiar with performance-based approaches to design and have an awareness of the capabilities – and limitations – of relevant advanced modelling methods for structures and fire. Our Building Research Establishment (BRE) Centre for Fire Safety Engineering hosts bespoke equipment to support groundbreaking research and teaching, with combined thermal and mechanical loading and use of the latest image analysis techniques.

This programme is fully accredited by the Joint Board of Moderators: www.jbm.org.uk

Programme structure

You study two semesters of taught courses, a research project and thesis.

SEMESTER 1 COURSES

Fire Science and Fire Dynamics; Structural Design for Fire; Finite Element Analysis for Solids; Fire Investigation and Failure Analysis; Thin-walled Members and Stability.

SEMESTER 2 COURSES

Fire Science Laboratory; Fire Safety Engineering Analysis and Design; The Finite Element Method; Structural Dynamics and Earthquake Engineering.

Career opportunities

Internationally, there is great demand for graduates in this field, with expertise in structural fire safety engineering particularly sought after as performance-based design expands. All of our previous graduates are in relevant employment, with the majority working in fire teams at engineering consultancies.

Minimum entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/country), in civil engineering or a related subject. Applicants with backgrounds in other fields may be accepted.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Programme contact MSc Administrator

Tel +44 (0)131 650 7352

Email pgtenquiries@eng.ed.ac.uk

www.ed.ac.uk/pg/22

Sustainable Energy Systems

MSc 1 yr FT

PgDip 9 mths FT

Programme description

This internationally renowned degree, based within a world-leading renewable energy research group, equips graduates and professionals with a broad and robust training. Wind, marine and solar energy technologies are covered, as well as the wider environment in which they fit, including: resource assessment; energy production, delivery and consumption; efficiency; sustainability; economics, policy and regulation; and grid/off-grid systems.

In addition, our MSc students actively engage in research as part of their dissertation projects either within the Institute for Energy Systems or with industry, with some joining our PhD community afterwards. This programme is affiliated with the University's Global Environment & Society Academy.

Programme structure

This programme is run over 12 months, with two semesters of taught courses followed by a research project leading to a masters thesis.

SEMESTER 1 COMPULSORY COURSES

Technologies for Sustainable Energy; Energy and Environmental Economics; Sustainable Energy Contexts; Either Electrical Engineering Fundamentals of Renewable Energy or Mechanical Engineering Fundamentals of Renewable Energy.

SEMESTER 2 COMPULSORY COURSES

Principles of Wind Energy; Marine Energy; Solar Energy and Photovoltaic Systems; and an MSc Dissertation project from May to August.

OPTION COURSES

Depending on quotas and timetabling, we can offer further courses from the Schools of Engineering, GeoSciences, Architecture, and Social & Political Science, and from Scotland's Rural College.

Career opportunities

Graduates go on to a wide range of activities in industry, public organisations or academia. The MSc has well established links with industry, with many graduates finding employment with leading national and international companies involved with energy, consultancy and engineering.

Minimum entry requirements

A UK 2:1 degree, or its international equivalent (www.ed.ac.uk/international/country), preferably in engineering or a physical science. Applicants with backgrounds in other fields, who studied mathematics to first year undergraduate level, may be accepted.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Programme contact MSc Administrator

Tel +44 (0)131 650 7352

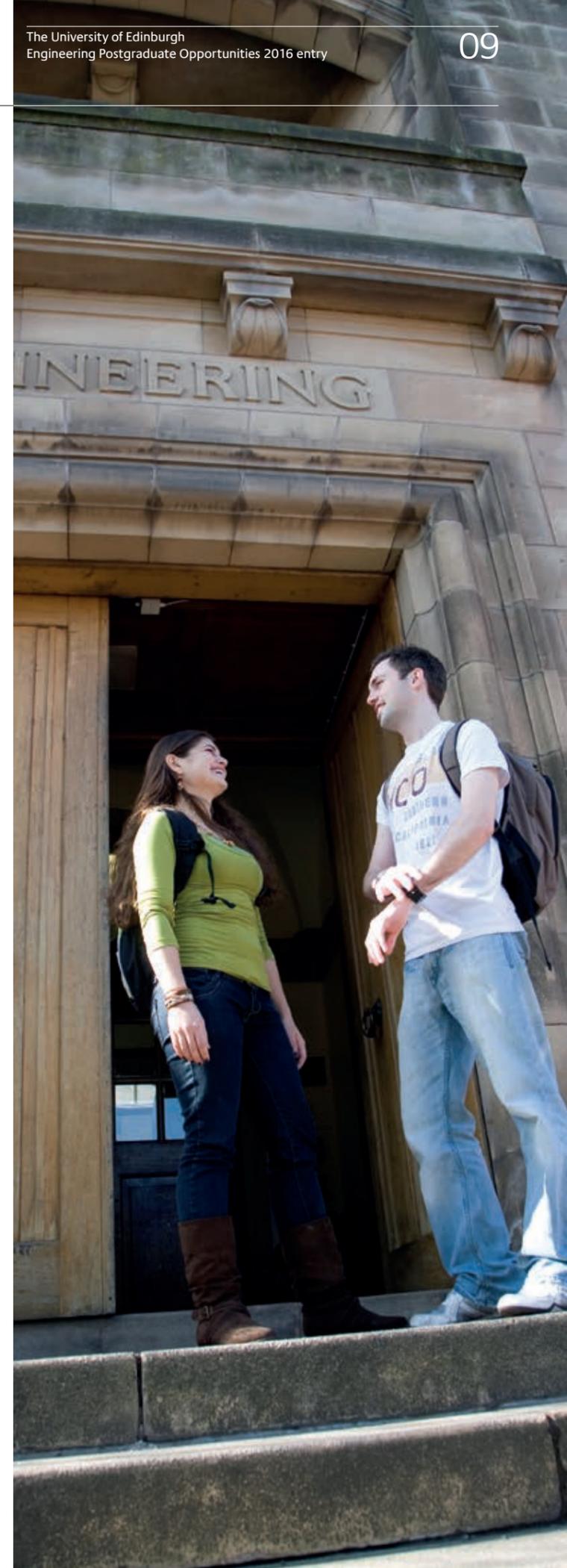
Email pgtenquiries@eng.ed.ac.uk

See also...

Some of the School of Engineering's taught masters degrees are closely related to those in other Schools and Colleges. You may be interested in programmes offered by the College of Medicine & Veterinary Medicine, or the Schools of Biological Sciences, Chemistry, GeoSciences, Informatics, Mathematics or Physics & Astronomy.

www.ed.ac.uk/studying/prospectus-request

Funding
See page
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Research at the School of Engineering

We offer a comprehensive range of exciting research opportunities through a choice of postgraduate degrees: PhD, EngD, MPhil and MSc by Research. We also provide a range of services to support you to develop your research project to its full potential.

Degree options

PhD

As a PhD candidate you pursue a research project under continuous guidance, resulting in a thesis that makes an original contribution to knowledge. In the School of Engineering you will be linked to two academic supervisors. If your project is industrially sponsored, you will also be linked to an industrial supervisor.

Postgraduate research students work within our six research institutes, which comprise members from our four disciplines: Chemical Engineering, Civil and Environmental Engineering, Electronics and Electrical Engineering, and Mechanical Engineering.

PhD with Integrated Study

The PhD with Integrated Study (PhD-IS) is a relatively new four-year doctoral degree with a 1+3 structure, which means you will complete one year of training, designed to develop your research capabilities, then undertake three years of PhD research. The PhD-IS is offered by the EPSRC Centre for Doctoral Training in Integrative Sensing and Measurement. It aims to equip engineers and scientists with the skills, knowledge and confidence to tackle today's evolving issues and future challenges: goo.gl/cdel89

EngD

This is a four-year doctoral level, research and training programme equivalent to a PhD but achieved through research which is much more industrially focused and designed to produce graduates who have a sound understanding of the business implications of industrial research activity. Professional doctorates are specialist qualifications aimed at professional development.

MSc by Research

An MSc by Research is based on a research project tailored to a candidate's interests. It lasts one year full time or two years part time. The project can be a shorter alternative to an MPhil or PhD, or a precursor to either – including the option of an MSc project expanding into MPhil or doctorate work as it evolves. It can also be a mechanism for industry to collaborate with the School.

MPhil

The Master of Philosophy (MPhil) degree resembles a PhD but generally takes two years instead of three and does not carry the same requirement for original contribution to knowledge. You pursue your individual research project under supervision, submitting your thesis at the end of the project.

Research support

The development of transferable skills is a vital part of postgraduate training and a vibrant, interdisciplinary training programme is offered to all research students by the University's Institute for Academic Development (IAD). The programme concentrates on the professional development of postgraduates, providing courses directly linked to postgraduate study (for example *Thesis Workshop* and *Paper Production*) and future careers (for example *Career Planning* and *Team Development*).

Courses run by the IAD are free and have been designed to be as flexible as possible so that you can tailor the content and timing to your own requirements.

More information:

www.ed.ac.uk/iad/postgraduates

Showcase your work

Every year, the School of Engineering's Graduate School organises a Postgraduate Research Conference to showcase the research carried out by students across the Research Institutes. Our researchers are strongly encouraged to present their research at conferences and in journals during the course of their PhD. They are also encouraged and supported to attend transferable skills courses provided by organisations such as the Engineering and Physical Sciences Research Council (EPSRC).

Business development

The role of our business development team is to help form industry partnerships, including the sponsoring of research, to enable the commercialisation of University intellectual property and successful technology transfer.

Edinburgh Research and Innovation, the University's research and commercialisation office, provides a complete range of services for researchers, inventors, consultants and entrepreneurs in the University's academic community.

More information:

www.research-innovation.ed.ac.uk

Career prospects

Research graduates enter a wide range of fields including communications, defence, medical imaging, engineering consultancy, construction, renewable energy and the semiconductor industry. Many go on to further research. Opportunities for our PhD graduates include postdoctoral fellowships, lecturing roles and research contracts in universities, research institutes or industry.

Research opportunities

www.ed.ac.uk/pg/873

Bioengineering

PhD 3 yrs FT (6 yrs PT available for UK/EU)

MPhil 2 yrs FT (4 yrs PT available for UK/EU)

MSc by Research 1 yr FT (2 yrs PT available for UK/EU)

Research environment

The Institute for Bioengineering connects engineering, physical sciences, biology and medicine, for innovative diagnostic and therapeutic biomedical devices and technologies. Research themes include:

- Synthetic Biology – to design and construct (e.g. to 'engineer') biological devices and systems, often at cellular level. Applications range from therapeutic to environmental.
- Tissue Engineering – the production of 3D or 2D scaffolds or guidance cues for biological cells. Applications are largely therapeutic and also include new forms of lab-on-chip technology.
- Biomedical Modelling and Measurement – understanding biological materials through modelling and measurement for applications in, for example, prosthetics, prediction of failure in blood vessels and the behaviour of bone with ageing. We also study the behaviour of biological materials experimentally and in most cases, non-invasively (e.g. via Raman spectroscopy and CARS microscopy).
- Biomedical Devices and Sensors – working with colleagues in chemistry, we develop sensors on silicon for simple biological parameters (e.g. oxygen concentration) along with sensors of specific biomarkers of disease and therapy.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate

For funding information see also page 18.

Contact

Tel +44 (0)131 651 7213

Email enggradoffice@ed.ac.uk

Find out more about research projects:
www.eng.ed.ac.uk/postgraduate/research/projects

We cover the entire field of engineering through our six specialist research institutes.



THE UNIVERSITY of EDINBURGH

Case study: Edinburgh's research with impact

Informing the safety of iconic constructions

True fire resistance, along with an understanding of just how fires grow and spread, is key to preventing tragedies. The University's BRE Centre for Fire Safety Engineering focuses on the two main areas of building fire safety – detection, containment and suppression of fires, and performance-based design. Over 40 years, the Centre and its committed group of researchers have transformed the way the world regards structural design for fire.

Project background

Engineering consultancy giant Arup faces the challenge of fire safety in every building project it takes on. For advice and expertise in this area, the company calls on the BRE Centre, which leads the way in innovative research and building methodologies. Drawing on the tradition of world-leading academic and practical expertise established by the Centre's distinguished founders and teaching staff, the Centre entered into collaboration with Arup on the design of London's Heron Tower to provide the designers with the tools they needed to analyse fire initiation, growth, and spread, and create a structural response appropriate to a large, multi-storey building with open plan compartments and a central atrium.

Project results

Without the information provided by the Edinburgh researchers, Heron Tower could not have been approved or built. The Centre's expertise is also sought by international building and fire code committees including the American Concrete Institute, the British Standards Institute, and the International Council on Tall Buildings and Urban Habitat. The BRE Centre has created an entirely new type of design consultancy in performance-based structural fire engineering, which is being applied to great advantage by major international engineering firms in UK buildings and further afield.

The Centre and its committed group of researchers have transformed the way the world regards structural design for fire.

See more online: www.ed.ac.uk/research/impact

www.ed.ac.uk/pg/24

Digital Communications

PhD 3 yrs FT (6 yrs PT available for UK/EU)
MPhil 2 yrs FT (4 yrs PT available for UK/EU)
MSc by Research 1 yr FT (2 yrs PT available for UK/EU)

Research environment

The Institute for Digital Communications (IDCOM) is the UK's leading research institute in signal processing and communications and is home to the Li-Fi research and development centre. We have three major centres of activity: signal processing, communications systems and tomographic imaging. Our programme of research delivers world-leading research in signal and image processing and communications from fundamental theoretical and algorithmic work through to its translation to specific audio, imaging, radar/sonar, and communications applications.

The Institute has excellent research facilities, including state-of-the-art computing systems and laboratories for agile tomography, and audio signal processing, as well as the Li-Fi research and development centre for visible light communications. Internationally recognised for our research on communications systems and signal processing, we offer research topics including: green radio; visible light communications; cognitive radio; compressive sensing; distributed sensor signal processing; and agile tomography.

IDCOM holds the only UK Research Council platform award in sensor signal processing, in collaboration with the joint research institute in signal and image processing at Heriot-Watt University, recognising our world-leading research status.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Contact

Tel +44 (0)131 651 7213
Email enggradoffice@ed.ac.uk

www.ed.ac.uk/pg/25

Energy Systems

PhD 3 yrs FT (6 yrs PT available for UK/EU)
MPhil 2 yrs FT (4 yrs PT available for UK/EU)
MSc by Research 1 yr FT (2 yrs PT available for UK/EU)

Research environment

The Institute for Energy Systems (IES) helps shape tomorrow's difficult energy decisions in decarbonising society. It continues a long line of world-leading innovation by Edinburgh researchers, including the 1970s 'Duck' wave energy converter, invented by Stephen Salter – now Emeritus Professor of Engineering Design.

Our research covers all aspects of the low carbon energy chain: resource modelling, impact of climate change, wind, wave, tidal, & solar energy, electrical power conversion, energy storage, carbon capture, biofuels and delivery into the electrical network. In addition, we have established a low carbon vehicle group developing more efficient internal combustion engines. IES is also involved in two doctoral training centres: the Industrial Centre for Offshore Renewable Energy (IDCORE) as lead partner and the Centre for Doctoral Training in Wind and Marine, led by Strathclyde University.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Contact

Tel +44 (0)131 651 7213
Email enggradoffice@ed.ac.uk

www.ed.ac.uk/pg/26

Infrastructure & the Environment

PhD 3 yrs FT (6 yrs PT available for UK/EU)
MPhil 2 yrs FT (4 yrs PT available for UK/EU)
MSc by Research 1 yr FT (2 yrs PT available for UK/EU)

Research environment

The Institute for Infrastructure and the Environment (IIE) is among the leading centres of civil and environmental engineering research in the UK. The Institute seeks new technologies to solve real-world problems in order to promote sustainability.

Key research areas include behaviour and design of structures in fire and other extreme events; fire science and fire safety engineering; shells and containment structures; nonlinear finite element modelling of complex structures and structural collapses; mechanics and transport of granular materials and multiphase media; computational mechanics and bio-mechanics; fibre-reinforced polymer composites in structural strengthening and repair; high-speed rail; intelligent infrastructure and non-destructive evaluation; sustainable water and wastewater treatment technologies; water supply; and waste management and resource recovery.

IIE has excellent laboratory and computing facilities, including the latest facilities and instrumentation for experimental and computational research in structures, granular solids, fire safety engineering, non-destructive testing and environmental engineering.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Contact

Tel +44 (0)131 651 7213
Email enggradoffice@ed.ac.uk

www.ed.ac.uk/pg/27

Integrated Micro & Nano Systems (IMNS)

PhD 3 yrs FT (6 yrs PT available for UK/EU)
MPhil 2 yrs FT (4 yrs PT available for UK/EU)
MSc by Research 1 yr FT (2 yrs PT available for UK/EU)

Research environment

The Institute for Integrated Micro and Nano Systems (IMNS) brings together researchers from integrated-circuit design, system-on-chip design, image-sensor design, bioelectronics, micro/nano-fabrication, microelectromechanical systems (MEMS), micromachining, neural computation and reconfigurable and adaptive computing.

Research interests include low-level analogue, low-power, adaptive and bio-inspired approaches, system-on-chip computing and applications from telecommunications to finance and astronomy. In addition, we have a strong and growing interest in applications relating to life sciences and medicine, particularly on bioelectronics, biophotonics and bio-MEMS.

IMNS has laboratory facilities that are unique within the UK, including a comprehensive silicon and MEMS micro-fabrication capability coupled with substantial design and test resources. The Institute has an excellent reputation for commercialising technology.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Contact

Tel +44 (0)131 651 7213
Email enggradoffice@ed.ac.uk

www.ed.ac.uk/pg/28

Materials & Processes

PhD 3 yrs FT (6 yrs PT available for UK/EU)
MPhil 2 yrs FT (4 yrs PT available for UK/EU)
MSc by Research 1 yr FT (2 yrs PT available for UK/EU)

Research environment

The Institute for Materials and Processes (IMP) brings together researchers from materials science and chemical, mechanical and bio-engineering, conducting world-class research into every conceivable kind of material. Work covers the design, synthesis and processing of materials, as well as biomedical and process engineering. IMP has one of the UK's largest carbon capture engineering research groups, and particular strength in biomedical and biological engineering. The Institute has excellent laboratory facilities, including the latest instruments for research in adsorption, biomedical engineering, conservation materials science, high pressure and temperature advanced materials synthesis, ice mechanics, and particular strength in multiphase flows and multiscale modelling. We provide high-quality training in research for both postgraduate students and postdoctoral researchers.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Contact

Tel +44 (0)131 651 7213
Email enggradoffice@ed.ac.uk

See also...

Much of our research is interdisciplinary and collaborative. You may be interested in programmes offered by the College of Medicine & Veterinary Medicine, the Schools of Biological Sciences, Chemistry, GeoSciences, or Informatics, or Edinburgh College of Art, which hosts the Edinburgh School of Architecture & Landscape Architecture.

www.ed.ac.uk/studying/prospectus-request

Taught professional doctorate

Professional doctorates are specialist qualifications aimed at professional development. The School of Engineering is home to two professional doctorate programmes; one in offshore renewable energy and one in sensor and imaging systems. These training and research programmes are equivalent in standing to a conventional PhD but are aimed at students who want a research career in industry.

You will complete a broad-based, masters-level training programme, then go on to carry out research while working directly with a company.

www.ed.ac.uk/pg/785
www.idcore.ac.uk

Offshore Renewable Energy

EngD 4 yrs FT

Programme description

The Industrial Doctoral Centre for Offshore Renewable Energy (IDCORE) is a partnership of the Universities of Edinburgh, Strathclyde and Exeter, together with the Scottish Association for Marine Science and the research association HR Wallingford.

IDCORE's four-year engineering doctorate programme is a doctoral-level research and training programme, equivalent in academic standing to a conventional PhD, but achieved through research that is much more industrially focused. It is designed to produce graduates who have a sound understanding of the business implications of industrial research. EngD students follow a programme based on three elements: postgraduate-level training; transferable skills and leadership; and research.

Programme structure

You will spend the first two semesters attending an intensive programme of 12 taught courses, delivered by internationally renowned academic staff from the partner universities. These first two semesters provide you with the skills required to get started on your research and to succeed in an industry environment. Practical courses teach important laboratory and fieldwork skills, while a group design project helps you develop teamworking skills and apply your knowledge.

Following this initial period of teaching, you will join a sponsoring company to work as a researcher for the rest of the programme. The industrial research is supplemented by summer schools delivered in Oban, Wallingford and Falmouth, and online integrated studies in management, business, innovation, enterprise and entrepreneurship.

At the end of the research work you will deliver either a doctoral thesis or a portfolio of related project work that is examined for the award of an EngD in Offshore Renewable Energy, which is a joint degree from the Universities of Edinburgh, Exeter and Strathclyde.

Funding

A scholarship that covers fees and a stipend is available for suitably qualified and eligible applicants. There are normally 10 of these scholarships available for each intake of students and they are awarded competitively. Full awards (stipend and fees) are available for EU citizens who have been living in the UK for at least three years before the start of the programme. Other EU candidates are eligible for a fees-only award if they are ordinarily resident in a member state of the EU. There is a small quota of full studentships for exceptional EU and international candidates. Applications from self-funded candidates will also be considered.

Minimum entry requirements

A UK first-class degree, or its international equivalent (www.ed.ac.uk/international/country). Students with a 2:1 degree and a subsequent MSc degree with distinction and substantial relevant work experience will also be considered. It is expected that candidates will have a good understanding of one or more branches of science or engineering and at least some relevant research experience.

Eligibility

Due to United Kingdom Border Agency (UKBA) regulations, we can now accept self-funded overseas students who need a CAS for a Tier 4 Visa.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Programme Director Professor David Ingram
Programme Administrator Vanessa McCorquodale
Email info@idcore.ac.uk

www.ed.ac.uk/pg/905
www.censis.org.uk/skills/engd/

Sensor & Imaging Systems

EngD 4 yrs FT

Programme description

Sensor and imaging systems (SIS) are central to modern life, and appear in fields as diverse as transport, biomedicine, agriculture and environmental monitoring. The Engineering Doctorate in Sensor & Imaging Systems is a vocational programme of leading edge research for industry in this field. Academically equivalent to a PhD, the EngD emphasises research in a commercial environment, supplemented by masters-level technical training and MBA-style business courses. Projects all have an industry sponsor and you will spend up to 75 per cent of your time working on-site with that company. EngD students, known as Research Engineers (REs), work closely with the sponsoring company, under the direction of an industrial supervisor and an academic supervisor from the University.

Programme structure

You will undertake two semesters of research-focused training, delivered by internationally renowned academic staff. The first semester is based in Glasgow and the second in Edinburgh. The curriculum has a substantial overlap with that of the EPSRC Centre for Doctoral Training in Integrative Sensing & Measurement and much of the training involves working together as a cohort or in smaller groups. It includes:

- the fundamentals and applications of sensor and imaging systems;
- focused practical courses on laboratory skills; and
- creativity, dissemination, advocacy, enterprise and transferable skills.

This is followed by a 40-month research project, based in a sponsoring company, and business and management courses offered by Heriot-Watt University's Edinburgh Business School. You will normally be matched with a company and project when your offer of a place is made. Projects reflect varied applications of sensing and measurement, across a range of sensing modalities – physical, chemical, mechanical, optical and more.

Funding

Suitably qualified and residentially eligible students receive an award comprising tuition fees, an enhanced tax-free student stipend and funding to support training, conference attendance and travel. Self-funded applicants will also be considered.

Career opportunities

SIS meets a range of societal, research and industrial needs. Sensing is vital for advances in capability across all fields of physics, engineering and chemistry. It is enhanced when individual sensing units are configured in arrays to enable imaging or if multiple sensing functions are integrated into a single smart system. Industrial SIS applications are ubiquitous: from mass-produced sensors found in modern smart phones and automobiles to the state-of-the-art, specialist, high-value sensors routinely used in oil and gas recovery, scientific equipment, machine tools, medical equipment and environmental monitoring.

Minimum entry requirements

A UK 2:1 honours degree or its international equivalent (www.ed.ac.uk/international/country), in a relevant science or engineering discipline. Entry is competitive so a UK first class degree, or its international equivalent, in engineering, physics, chemistry or another relevant physical science is preferred. Students with other qualifications and/or experience may be considered, as may applicants with backgrounds in other fields.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate
For funding information see also page 18.

Programme Director Doctor Tony Kelly (anthony.kelly@glasgow.ac.uk)
Programme Administrator Sian Williams, CENSIS (sian.williams@censis.org.uk)
Edinburgh enquiries Professor Ian Underwood (i.underwood@ed.ac.uk)



Riding the wave

Follow IDCORE's pioneering work: [@idcoreprogramme](https://twitter.com/idcoreprogramme)
www.twitter.com/idcoreprogramme



PhD with Integrated Study

This four-year doctoral programme has a 1+3 structure, which means you will complete one year of training, to develop your research capabilities, then three years of PhD research. It is carried out in the EPSRC Centre for Doctoral Training in Integrative Sensing and Measurement (CDT-ISM), which aims to equip engineers and scientists with the skills, knowledge and confidence to tackle today's evolving issues and future challenges.

www.ed.ac.uk/pg/896
<https://goo.gl/f5TU3S>

Integrative Sensing & Measurement

PhD with Integrated Study 4 yrs FT

Programme description

Sensing and measurement are fundamental scientific abilities that impact all aspects of modern life and have revolutionised areas as diverse as transport, biomedicine, agriculture and environmental monitoring.

This PhD with Integrated Study is a four-year doctoral degree with a 1+3 structure, which means you will complete one year of training, designed to develop your research capabilities, then undertake three years of PhD research. The PhD is carried out within the EPSRC Centre for Doctoral Training in Integrative Sensing and Measurement (CDT-ISM).

The CDT is supported internationally by a range of universities, research labs, and companies offering support and collaboration, including Selex, Thales, ST Microelectronics and Optos.

Programme structure

We offer one year of research-focused training, delivered by internationally renowned academic staff. The first semester, based in Glasgow, focuses on fundamentals and the second semester, based in Edinburgh, focuses on applications. You will develop the skills necessary to be effective and to prosper in a research environment. Much of the training involves working together as a cohort or in smaller groups. It includes:

- the fundamentals and applications of sensor and imaging systems;
- focused practical courses on laboratory skills; and
- creativity, dissemination, advocacy, enterprise and other transferable skills.

This is followed by a mini research project and then a 36-month PhD project with either the University of Glasgow or the University of Edinburgh. Project opportunities reflect the varied applications of sensing and measurement, across a wide range of sensing modalities such as physical, chemical, mechanical, optical and more.

Placements

International and UK placements are available with our partner institutions, which include the Universities of Twente, Stanford, Caltech, Duke and Tokyo, and the Fraunhofer Institute and the National Physical Laboratory.

Career opportunities

Sensing and measurement underpin a vast range of societal, research and industrial needs. Sensing is essential for advances in capability across all fields of physics, engineering and chemistry. It is enhanced when individual sensing units are configured in arrays to enable imaging and when multiple sensing functions are integrated into a single smart system. Industrial applications of sensing and measurement are ubiquitous: from mass-produced sensors found in modern smart phones and every modern automobile to the state-of-the-art, specialist high-value sensors routinely used in oil and gas recovery, scientific equipment, machine tools, medical equipment and environmental monitoring. The CDT programme is intended to equip you for career directions including academia, research, industry and beyond.

Minimum entry requirements

A UK 2:1 honours degree or its international equivalent (www.ed.ac.uk/international/country), in a relevant science or engineering discipline. However entry is highly competitive so a UK first class degree, or its international equivalent, in engineering, physics, chemistry or another relevant physical science is preferred. Students with other qualifications and/or experience may be considered, as may applicants with backgrounds in other fields.

English language requirements

See page 17.

Fees and funding

www.ed.ac.uk/student-funding/postgraduate

For funding information see also page 18.

Funding

Scholarships that cover fees and a stipend are available for suitably qualified and eligible applicants. There are typically 13 of these scholarships available for each annual intake of students and they are awarded competitively. Applications from self-funded candidates will also be considered.

Programme contact CDT Administrator

Tel +44 (0)131 650 7815

Email cdtism-administrator@eng.ed.ac.uk

How to apply

We have an online application process for all postgraduate programmes. The system gives full instructions, including details of any supporting documentation you need to submit, such as references, degree transcripts or research proposals.

When applying, you will set up an account, which lets you save your application and continue at another time.

Full guidance on our application system is available at: www.ed.ac.uk/postgraduate/applying

General requirements

Our usual entrance requirement for postgraduate study is a UK 2:1 degree, or its international equivalent (see www.ed.ac.uk/international/country), in engineering, chemistry, biosciences, geosciences, physical sciences or mathematics. You will also need to meet the University's language requirements (see right).

Entry requirements for individual programmes can vary, so check the details for the specific programme you wish to apply for.

Our selection process for PhD programmes is competitive. Experience working within your chosen field can be beneficial, but an MSc is not always required for entrance to doctorate degree studies.

References

For applications to taught programmes, the normal requirement is one reference, although an additional reference may be requested in individual cases. For applications to research programmes, two references are required. You should check online for exact requirements for your intended programme of study. For general guidance on references, visit: www.ed.ac.uk/postgraduate/references

Deadlines

Some programmes have application deadlines. Please check online for details. For all other programmes, you are encouraged to apply no later than one month prior to entry to ensure there is sufficient time to process your application. However, earlier application is recommended, particularly where there is a high demand for places or when a visa will be required. Should you wish to submit a late application, please

contact us for guidance. If you are applying for funding, in most cases you will need an offer to study with us before you can make your funding application.

Procedure: taught programmes

- Thoroughly explore this prospectus and our website to identify your preferred programme of study. Feel free to contact the MSc administrator (see opposite) to discuss your application.
- Check you meet all entry requirements. Check whether a separate application is needed for funding. Check any deadlines.
- Visit www.ed.ac.uk/pg/degrees, navigate to your chosen programme, and click on Apply. Follow the instructions within the online application system.

Procedure: research programmes

- Thoroughly explore this prospectus and our website to identify which area of our research matches your interests. Suggested research projects are listed by our research institutes online (see www.eng.ed.ac.uk/postgraduate), and we also welcome any proposal that fits with the School's research plans and supervisory capabilities.
- We strongly recommend that you contact us to discuss your proposed programme of study, so that we can ensure the availability of facilities and expert supervision.
- Check you meet all entry requirements. Check whether a separate application is needed for funding. Check any deadlines.
- Visit www.ed.ac.uk/pg/degrees, navigate to your chosen programme, and click on Apply. Follow the instructions within the online application system.

Joining us from overseas

International applicants are advised to check the University's website to find out more about their visa options and our Integrated English for Academic Purposes (IEAP) programme. More information: www.ed.ac.uk/international/ieap

International agents

The University has certified representative agents in the following locations: Brunei, Canada, China, Gulf Region, Hong Kong, India, Japan, Jordan, Korea, Malaysia, Mexico, Nigeria, Norway, Russia, Saudi Arabia, Singapore, South Africa, South Korea, Taiwan, Thailand, Turkey, Zambia and Zimbabwe. International applicants can use an agent to help guide them through the application process if necessary. For more information visit: www.ed.ac.uk/international/country

English language requirements

Students whose first language is not English must show evidence of one of the qualifications below.

- IELTS Academic: total 6.5 (at least 6.0 in each module).
- TOEFL-iBT: total 92 (at least 20 in each module).
- PTE(A): total 61 (at least 56 in each of the Communicative Skills sections).
- CAE and CPE: total 176 (at least 169 in each module).

Please note:

- English language requirements can be affected by government policy so please ensure you visit our degree finder to check the latest requirements for your programme: www.ed.ac.uk/pg/degrees
- Your English language certificate must be no more than two years old at the beginning of your programme.
- We also accept recent degree-level study that was taught and assessed in English in a majority English speaking country (as defined by UK Visas & Immigration).

Abbreviations: IELTS – International English Language Testing System; TOEFL-iBT – Test of English as a Foreign Language Internet-Based Test; PTE(A) – Pearson Test of English (Academic); CPE – Certificate of Proficiency in English; CAE – Certificate in Advanced English.

www.ed.ac.uk/english-requirements/pg

Funding

A large number of scholarships, loans and other funding schemes are available for your postgraduate studies. For further information on applications and eligibility, please visit: www.ed.ac.uk/student-funding/postgraduate.

Awards are offered by the School of Engineering, the College of Science & Engineering, the University of Edinburgh, the Scottish, UK and international governments and many funding bodies.

Tuition fee discounts

We offer a 10 per cent discount on postgraduate fees for all alumni who have graduated with an undergraduate degree from the University. We also offer a 10 per cent discount for international graduates who spent at least one semester at the University of Edinburgh as a visiting undergraduate: www.ed.ac.uk/student-funding/discounts

Key

- Taught masters programmes
- Masters by Research programmes
- Research programmes

Loans available for study at the University of Edinburgh

The University of Edinburgh is a participating institution in the following loans programmes, meaning we certify your student status and can help with the application process.

• The Canada Student Loans Program ●●●

The University is eligible to certify Canadian student loan applications: www.ed.ac.uk/student-funding/canadian-loans

• The Student Awards Agency Scotland ●●

The Student Awards Agency Scotland offers eligible students postgraduate tuition fee loans for eligible programmes: www.ed.ac.uk/student-funding/pg-loan

• US Student Loans ●●●

The University is eligible to certify loan applications for US loan students. Full details on eligibility and how to apply can be found online: www.ed.ac.uk/student-funding/us-loans

Research council awards

Research councils offer awards to masters, MPhil and PhD students in most of the Schools within the University of Edinburgh. All studentship applications from the research councils must be made through the University, through your School or College office. Awards can be made for both taught and research programmes.

Normally only those UK/EU students who have been resident in the UK for the preceding three years are eligible for a full award. For some awards, candidates who are EU nationals and are resident in the UK may be eligible for a fees-only award. www.ed.ac.uk/student-funding/research-councils

University of Edinburgh scholarships

The University offers a number of scholarships in partnership with the following overseas government agencies:

- **Chile ●●●**
National Commission for Scientific and Technological Research (CONICYT): www.conicyt.cl
- **Colombia ●**
Administrative Department of Science, Technology and Innovation (Colciencias): www.colciencias.gov.co
- **Ecuador ●●●**
Secretaria Nacional de Educacion Superior, Ciencia y Tecnologia (SENESCYT): www.educacionsuperior.gob.ec
- **Iraq ●**
Ministry of Higher Education and Scientific Research: www.en.mohehr.gov.iq/
- **Mexico**
National Council of Science and Technology of the United Mexican States (CONACYT): ●●● www.conacyt.mx

Banco de Mexico and the Banco de Mexico's FIDERH trust (FIDERH): ●●● www.fiderh.org.mx

Fundacion Mexicana para la Educacion, la Tecnologia y la Ciencia (FUNED): ●● www.funedx.org

Other scholarship opportunities include:

• China Scholarships Council/University of Edinburgh Scholarships (China) ●

A number of scholarships for PhD study to candidates who are citizens and residents of China: www.ed.ac.uk/student-funding/china-council

• Edinburgh Global Masters Scholarships ●●

A number of scholarships are available to international students for masters study: www.ed.ac.uk/student-funding/masters

• Edinburgh Global Research Scholarships ●

These scholarships are designed to attract high-quality international research students to the University: www.ed.ac.uk/student-funding/global-research

• Eric Liddell China Saltire Scholarships (China) ●●

Ten scholarships are available to Chinese citizens who are permanent residents of mainland China who are accepted on a full-time masters degree programme: www.ed.ac.uk/student-funding/liddell

• Highly Skilled Workforce Scholarships ●

A number of scholarships are available to UK nationals who are permanently domiciled in Scotland, and to EU nationals domiciled either on mainland EU or in Scotland, who have been accepted on an eligible full-time or part-time masters programme. The scholarships will cover the UK/EU tuition fee: www.ed.ac.uk/student-funding/sfc-hsw

• Julius Nyerere Masters Scholarships (Tanzania) ●●

One scholarship is available to citizens of Tanzania who are normally resident in Tanzania who are accepted on a full-time masters degree programme: www.ed.ac.uk/student-funding/nyerere

• Maudslay Scholarship (Mexico) ●●

One scholarship is available to Mexican nationals studying on a masters programme within the School of Engineering: www.ed.ac.uk/student-funding/maudslay

• School of Engineering International Masters Scholarships ●

Three scholarships are available to students accepted on a full-time masters degree: www.ed.ac.uk/student-funding/postgraduate/eng-masters

• Southern African Scholarship ●●●

One award for masters study available to students from selected southern African countries: www.ed.ac.uk/student-funding/postgraduate/southern-africa

• UK/EU Masters Scholarships ●●

A number of scholarships for UK and EU students who have been accepted on a full-time masters degree programme: www.ed.ac.uk/student-funding/uk-masters

• University of Edinburgh PhD Scholarships ●

A number of scholarships, open to UK, EU and international PhD students: www.ed.ac.uk/student-funding/development

Other sources of funding

The following lists scholarships and support schemes available to students from particular countries who meet specific eligibility criteria.

• Beit Trust ●●●

Beit Trust Scholarships support postgraduate students from Malawi, Zambia and Zimbabwe, usually to undertake a masters degree: www.beittrust.org.uk

• Chevening Scholarships ●●

A number of partial and full funding scholarships are available to one-year masters students: www.chevening.org

• Commonwealth Scholarships ●●●

Scholarships available to students who are resident in any Commonwealth country, other than the UK: www.dfid.gov.uk/cscuk

• Fulbright Scholarships (USA) ●●●

Scholarships open to US graduate students in any subject wishing to study in the UK: www.iie.org/fulbright

• Marshall Scholarships (USA) ●●●

Scholarships available to outstanding US students wishing to study at any UK university for at least two years: www.marshallscholarship.org

• Panasonic Trust Fellowships ●●

These fellowships provide financial support to selected engineers studying a full-time MSc in subjects related to environmental technology, energy, sustainable development, natural resources, materials and the built environment: www.panasonictrust.net/fellowships

• Scotland's Saltire Scholarships ●●

A number of scholarships open to students who are citizens permanently and ordinarily resident in Canada, China, India and the USA for one year of masters study: www.ed.ac.uk/student-funding/saltire

• Silber Bequest ●●●

Funding is available to prospective postgraduate students living in the UK who have been granted refugee status: www.ed.ac.uk/student-funding/silber



Campus map

The School of Engineering is based at the Faraday Building on the King's Buildings campus. The campus is around two miles from Edinburgh city centre and is well served by buses, including a free University shuttle service during semester time.

Detailed maps
can be found at:
www.ed.ac.uk/maps



Get in touch

Contact us

For more information about MSc programmes at the School of Engineering contact:

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The King's Buildings
Edinburgh EH9 3DW
Tel +44 (0)131 650 7352
Email pgtaught@eng.ed.ac.uk

For more information about applying for our research programmes, contact:

The Graduate School
School of Engineering
Sanderson Building
Robert Stevenson Road
The King's Buildings
Edinburgh EH9 3FB
Tel +44 (0)131 651 7213
Email engradoffice@ed.ac.uk

To discuss your research proposal, please contact potential supervisors. Details can be found at the Research Institutes' web pages, via www.eng.ed.ac.uk/postgraduate

For information about the taught professional doctorate contact:

Industrial Doctoral Centre for Offshore Renewable Energy
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The King's Buildings
Edinburgh EH9 3FB
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Visit us

The University's Postgraduate Open Day is your opportunity to come and meet current staff and students. Our next campus-based Open Day takes place on Wednesday 18 November 2015. For more information, visit: www.ed.ac.uk/postgraduate-open-day

The University also runs online information sessions for prospective postgraduate students throughout the year. For more information, visit: www.ed.ac.uk/postgraduate/online-events

In addition, the School of Engineering runs virtual visits for taught MSc programmes throughout the year, and we invite all applicants to these. Those who have yet to apply should contact the MSc Administrator for more details. Prospective research students wishing to visit should contact the Graduate School.





18 Nov 2015

Postgraduate Open Day

[www.ed.ac.uk/
postgraduate-open-day](http://www.ed.ac.uk/postgraduate-open-day)

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