UNIVERSITY OF BIRMINGHAM

CIVIL ENGINEERING

POSTGRADUATE STUDIES IN CIVIL ENGINEERING

Introduction to Civil Engineering

EQUIPPING YOU WITH THE KNOWLEDGE AND TOOLS TO BUILD COMMUNITIES OF THE FUTURE.

The Department of Civil Engineering at the University of Birmingham is founded on our world-leading teaching, research and engagement with industry and government. Our diverse and vibrant community of academics, researchers and students, are working towards solving the economic, environmental and social challenges that the world faces. Our flexible postgraduate portfolio offers taught programmes at MSc or PG Dip, or via a research route with a PhD or MPhil. Whichever you choose, you'll develop the skills, knowledge, and attitudes necessary to lead society's response to these challenges. So, whether we're teaching the principles of structural engineering to build resilience into our infrastructure; understanding how Civil Engineers can build new roads and sustainable communities; or how geotechnical engineers can use condition monitoring technologies to change our urban communities, you'll have complete control over your career development. Civil Engineering at the University of Birmingham is a place where change happens, where you'll learn to make a difference, and where futures are built.

Dr Karl Dearn
Head of Department
Civil Engineering

Postgraduate programmes
Postgraduate study at the University of Birmingham is a chance to learn from world leaders in their fields. This guarantees you a first-class learning experience, leading to a qualification that is respected the world over, making you an attractive prospect in a very competitive job market.

We offer a stimulating, thriving research environment, and offer a warm welcome to postgraduate students seeking to contribute to our work. Our portfolio includes both taught and research programmes.

Why choose Birmingham?

- Discover how civil engineering, in all its aspects, is a cornerstone of both the development and sustainability of civilisations
- Benefit from our broad range of academic staff and research skills, giving you the opportunity to study subjects that lie between the traditional disciplines or which focus in depth on a particular field
- Research at Birmingham places a strong emphasis on tackling the problems faced by society today, and many of our projects have already made a significant impact on society
- The Department has a long tradition of distinguished research that benefits from being funded by industry, charities and research councils, encouraging innovative thinking and creating internationally recognised results
- Alumni from our MSc programmes are found in nearly every country around the world, and we are held in high regard by the engineering community
- All our Masters programmes are recognised or accredited by the Joint Board of Moderators, which integrates The Institution of Civil Engineers, the Institution of Structural Engineers, the Chartered Institution of Highways and Transportation, and the Institute of Highway Engineers (see www.jbm.org.uk)

CONTENTS

Civil Engineering

MSc/PGDip

Develop subject-specific and transferable skills to enhance your career.

FACT FILE

Start Date: September
Duration: 1 year full-time or 2–3 years part-time
Fees for 2020–21: MSc: UK/EU – £9,990 full-time, £4,950 part-time; international – £23,310 full-time; PGDip: UK/EU – £6,600 full-time, £3,300 part-time; International – £15,540 full-time
Entry requirements: 2:1 Honours degree in Civil Engineering or a relevant non-engineering subject; industrial experience and CEng/IEng qualifications will also be taken into account

This programme is designed for civil engineering graduates and graduates with related degrees wishing to study a general Masters-level course rather than specialise in one subject area. Students can tailor their studies to meet the needs of their chosen career path by selecting from a wide range of modules to support their individual research projects. Our graduates enjoy worldwide careers in consultancy, contracting industry, or choose a career which is underpinned by a good understanding of civil engineering.

Course content

This course consists of 180 credits. As well as your core modules, you will choose a 20-credit module from the themes of Structural, Water and Geotechnical Engineering (total 60 credits) and two other options (total 40 credits).

Core modules

- Financial Decision-Making in the Business Environment – 10 credits
- Synoptic Engineering – 10 credits
- Advanced Project – 60 credits

Optional modules (all 20 credits)

- Seimic Engineering (structural)
- Structural Engineering (structural)
- Modelling and Design for Fluid Dynamics (water)
- Wind Engineering and Bluff Body Aerodynamics (water)
- Underground Construction (geotechnical)
- Geotechnical Engineering 3
- Road Asset Management
- Sustainable Construction
- Engineering Production and Risk Management
- Sustainable Transport Policy
- Road Design and Planning
- Pavement Engineering

More about the course

The flexible nature of the course also means that graduates from non-civil engineering disciplines may be eligible for study. The taught element of your course takes place between September and May, and your individual research project will be undertaken from May to September. You can transfer from the Postgraduate Diploma to the MSc programme, upon completion of the Diploma, provided you satisfy the MSc requirements.

You will develop a broad knowledge base and understanding of the civil engineering profession and acquire problem-solving, team working, and communication skills; all essential when dealing with complex issues in this multi-disciplinary profession.

World-class learning and teaching

The course is delivered in intense week-long modules, so you can choose to study either full-time or part-time. Learning is delivered via lectures, tutorials, workshops, industrial seminars and site visits, as well as your individual project. We have extensive laboratories and other facilities both on and off our campus for undertaking research in geotechnical engineering, water engineering, wind engineering and structural engineering.

LEARN MORE

For full module information and an online application form, please visit our dedicated web pages, or contact our programme staff with your questions.

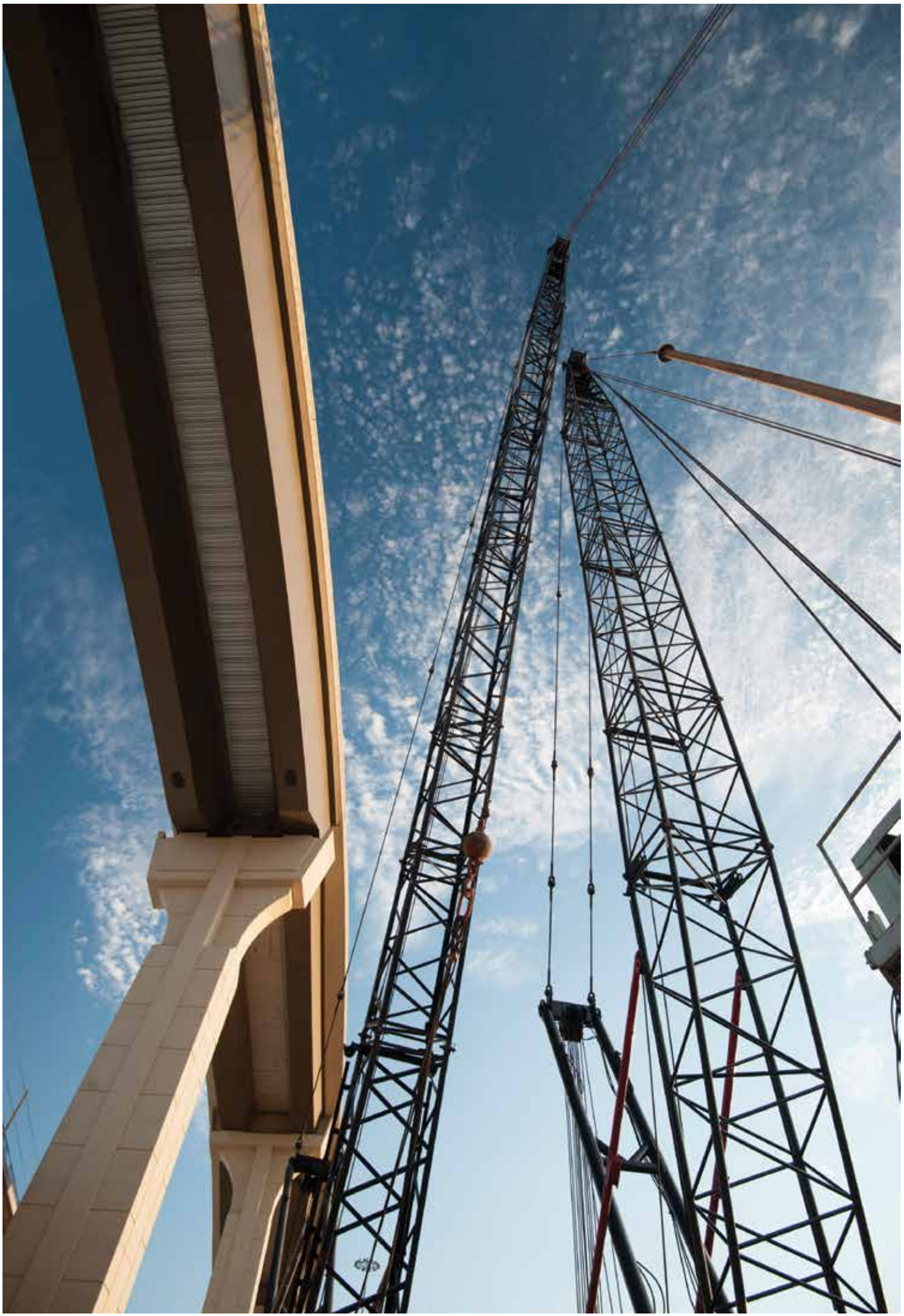
Tel: +44 (0)121 414 5089
Email: pgtengineering@contacts.bham.ac.uk

CAREERS

Enhance your professional prospects

Upon graduation, you can choose to begin or resume a career in civil engineering design consultancies, general management/ engineering consultancies, civil engineering contractors, construction and structural engineering companies. Your MSc counts towards achieving Chartered Engineer accreditation.

NEXT STEPS For module information and to apply, visit: **www.birmingham.ac.uk/msc-civil-engineering**



Civil Engineering and Management

MSc/PGDip/PGCert

Fulfil an industry need for engineers with managerial skills and experience.

FACT FILE

Start Date: September
Duration: 1 year full-time or 2–3 years part-time
Fees for 2020–21: MSc: UK/EU – £9,990 full-time, £4,950 part-time; International – £23,310 full-time; PGDip: UK/EU – £6,600 full-time, £3,300 part-time; International – £15,540 full-time; PGCert: UK/EU – £3,300 full-time, £3,300 part-time; International – £7,700 full-time
Entry requirements: 2:1 Honours degree in Civil Engineering or a relevant non-engineering subject; industrial experience and CEng/IEng qualifications will also be taken into account

Designed for civil engineering graduates and graduates with related degrees, this programme allows you to study project and construction management within a technical civil engineering context. You will learn about the working of engineering and construction organisations, discovering the disciplines and techniques of practical use in civil engineering, management and implementation of all stages of construction and civil engineering projects. The course opens up a wide range of career opportunities, with students tailoring studies towards their chosen career by selecting relevant modules, plus completing an individual research project.

Course content

This course consists of 180 credits. As well as your five core modules, you must choose a 20-credit module from the theme of Structural Engineering a 20-credit module from the theme of Geotechnical Engineering.

Core modules

- Financial Decision-Making in the Business Environment – 10 credits
- Sustainable Construction – 20 credits
- Engineering Production and Risk Management in Construction – 20 credits
- Construction Management – 20 credits
- Synoptic Engineering – 10 credits
- Advanced Project – 60 credits

Optional modules (all 20 credits)

- Structural Engineering 3 (Structures)
- Forensic Engineering (Structures)
- Earthworks Engineering (Geotechnical)
- Geotechnical Engineering 3 (Geotechnics)

More about the course

The nature of the course also means that graduates from non-civil engineering disciplines may be eligible for study. The taught element of your course takes place between September and May, and your individual research project will be undertaken from May to September (MSc students only). You can transfer from the Postgraduate Diploma to the MSc programme, upon completion of the Diploma, provided you satisfy the MSc requirements.

World-class learning and teaching

The course is delivered in intense week-long modules, so you can choose to study full-time or part-time. Learning is delivered via lectures, seminars, tutorials, workshops, coursework, group project work and site visits, as well as your individual project. We have extensive laboratories and other facilities both on and off our campus for undertaking research in geotechnical engineering, water engineering, wind engineering and structural engineering.

CAREERS

Enhance your professional prospects
The management skills and knowledge you acquire during these studies, coupled with technical learning will open up a wide range of career opportunities.

LEARN MORE

For full module information and an online application form, please visit our dedicated web pages, or contact our programme staff with your questions.

Tel: +44 (0)121 414 5089
Email: pgtengineering@contacts.bham.ac.uk

Image courtesy of Carillion

NEXT STEPS For module information and to apply, visit: **www.birmingham.ac.uk/msc-civil-engineering**

I am about to finish my MSc course and I feel more prepared to take up roles with management duties. This degree has definitely prepared me for future challenges and gives me an advantage over other people in the eyes of prospective employers. The University also offers a lot of optional courses that are really helpful, from technical writing courses to seminars by industry leaders.

CHUN PANG LEE, MALAYSIA, Civil Engineering and Management MSc.

ASK US A QUESTION: www.pg.bham.ac.uk/ask

Geotechnical Engineering
Geotechnical Engineering and Management

MSc/PGDip

Gain high-level training and support your technical skills.

FACT FILE

Start Date: September
Duration: 1 year full-time
or 2–3 years part-time
Fees for 2020–21: MSc: UK/EU – £10,800 full-time; International – £23,310 full-time; PGDip: UK/EU – £8,250 full-time; PGCert: UK/EU – £4,125
Entry requirements: 2:1 Honours degree in a relevant subject (eg, Engineering, Science, Geology or Mathematics.) Practical experience may also be considered

Designed for recent graduates or experienced professionals, this programme is ideal for civil engineers and geologists seeking to extend their professional scope or specialise in geotechnical engineering. You will develop a sound knowledge of soil and rock mechanics. These will support your career as a geotechnical engineer, enabling you to plan and direct ground investigations and laboratory testing, giving you the basis for interpreting results and proposing the optimum methods of design and construction.

Course content

This course consists of 180 credits.
This comprises a 60-credit individual research project plus 120 credits in taught learning.

Core modules

- Research Project – 60 credits
- Soil Mechanics – 20 credits
- Foundation Engineering – 20 credits
- Slopes and Retaining Structures – 20 credits
- Ground Investigation – 20 credits
- Engineering Earthworks – 20 credits

Additional core module for MSc Geotechnical Engineering

- Underground Construction – 20 credits

Additional core module for MSc Geotechnical Engineering and Management

- Geotechnical Asset Management – 20 credits

More about the course

With an excellent reputation across the industry, the course focuses on essential aspects of the subject, including: physical, chemical and mechanical properties of soils and rocks; ground investigation; field and laboratory testing; engineering geology and site investigation; analysis, design and construction of foundations, retaining walls, tunnels, embankments and slopes including methods of ground reinforcement and improvement. The Management programme also covers managerial skills for the construction industry, including groundworks and risk management.

The research project allows for detailed study into a particular area of geotechnical engineering and can focus upon laboratory testing, numerical modelling or management of geotechnical processes/applications.

World-class learning and teaching

The programme includes a field trip and laboratory practicals, and is supported by local companies which provide visiting lecturers, materials and access for site visits to enhance your learning experience. All students are expected to attend the Midland Geotechnical Society lectures (normally held monthly at the University) to widen understanding of the industry during your time at Birmingham.

We have extensive facilities including the National Buried Infrastructure Facility (NBIF). A 'one of its kind' facility for research, education and training in buried infrastructure-ground interaction, soil stabilisation and improvement, geophysical sensing, pipeline detection and condition assessment.

CAREERS

Enhance your professional prospects

Graduates are held in high regard by the geotechnical and related industry, and often secure employment before they graduate. They often join a specialist geotechnical engineering company or a general engineering organisation, as a specialist engineer in this area.

LEARN MORE

For full module information and an online application form, please visit our dedicated web pages, or contact our programme staff with your questions.

Tel: +44 (0)121 414 5089
Email: pgtengineering@contacts.bham.ac.uk

NEXT STEPS

For module information and to apply, visit:

www.birmingham.ac.uk/msc-geotechnical
www.birmingham.ac.uk/msc-geotechnical-mgt

Road Management and Engineering

MSc/PGDip

Study on one of the world's leading educational programmes in the road sector.

FACT FILE

Start Date: September
Duration: 1 year full-time
or 2–3 years part-time
Fees for 2020–21: MSc: UK/EU – £9,990 full-time, £4,950 part-time; international – £23,310 full-time; PGDip: UK/EU – £6,600 full-time, £3,300 part-time; International – £15,540 full-time
Entry requirements: 2:1 Honours degree in a relevant subject (eg, Engineering, Science, Geology, or Mathematics). Practical experience may also be considered.

This programme will equip you with the skills and knowledge you need for the planning, appraisal, design construction and maintenance of road networks.

Content is geared towards conditions found in developed and developing countries, and the course is suitable for road engineers and civil engineering graduates seeking to take their career into road management. Here, you will learn to originate innovative research, transfer current thinking into practice and respond effectively to the road industry needs.

Course content

This course consists of 120 credits.
This comprises a 60-credit individual research project plus 120 credits in taught learning.

Core modules

- Road Asset Management – 20 credits
- Pavement Engineering – 20 credits
- Sustainable Transport Policy – 20 credits
- Road Design and Planning – 20 credits
- Road Economics and Financing – 20 credits
- Individual Research Project – 60 credits
- Road Safety – 10 credits
- Rural Roads – 10 credits

More about the course

The course has been devised to meet the demands of both the UK and overseas road industry. It offers advanced training to engineers aspiring to higher or middles management in public and private sector road management.

Management-focused modules complement the range of subjects taught in the engineering-oriented modules and include state-of-the-art principles and practices associated with road asset management, economics and financing, HDM-4 (the World Bank's de facto standard for road investment appraisal) and planning.

World-class learning and teaching

The programme is taught by experts in their field with a wealth of international experience using modern teaching methods which mix traditional lectures, tutorials, small group activities, e-learning resources, projects, computer-based activities and field work to foster learning. These are complemented by site visits and a series of lectures delivered by distinguished guest speakers from industry on pertinent and current topics. Each module is delivered over two intensive weeks.

LEARN MORE

For full module information and an online application form, please visit our dedicated web pages, or contact our programme staff with your questions.

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Image courtesy of Balfour Beatty

CAREERS

Enhance your professional prospects

Graduates are held in high regard and many of today's senior executives in road authorities throughout the world are graduates of the programme. Our excellent links with industry ensure that the vast majority of graduates find rewarding employment and amongst our recent graduates are those who have joined the World Bank, government road agencies, local authorities, international arms of consulting engineers, niche asset management specialists and road contractors as well as those who have gone on to PhD study. Your MSc counts towards achieving Chartered Engineer accreditation.

NEXT STEPS

For module information and to apply, visit: **www.birmingham.ac.uk/msc-road-mgt**

Structural Engineering

MSc/PGDip/PGCert

Widen your knowledge to include structural, wind and geotechnical engineering, and more.

FACT FILE

Start Date: September
Duration: 1 year full-time or 2 years part-time
Fees for 2020–21: MSc: UK/EU – £9,990 full-time, £4,950 part-time; international – £23,310 full-time; PGDip: UK/EU – £6,600 full-time, £3,300 part-time; International – £15,540 full-time
Entry requirements: 2:1 Honours degree in civil engineering or a relevant non-engineering subject; industrial experience and CEng/IEng qualifications are also taken into account

Designed for civil engineering graduates looking to specialise as structural engineers, or those seeking to advance their career prospects in the industry, this course will enable you to deal with complex structural engineering issues. Decision making at a high level is often demanded by the industry, and here you will learn the techniques and unlock the confidence to use your initiative, communicate conclusions and solutions and tackle often-unpredictable scenarios.

Course content

This course consists of 180 credits.
This comprises a 60-credit individual research project plus 120 credits in taught learning.

Core modules (all 20 credits)

- Advanced Structures and Design
- Foundation Engineering
- Seismic Engineering
- Forensic Engineering
- Structural Engineering Practice
- Experimental and Numerical Techniques in Structural Engineering
- Advanced Project – 60 credits

More about the course

The course has been devised to meet the demands of both the UK and overseas engineering and construction industries. It offers advanced training to engineers aspiring to higher or middle management in public and private sector management. You can transfer from the Postgraduate Diploma to the MSc programme, upon completion of the Diploma, provided you satisfy the MSc requirements.

World-class learning and teaching

Learning is delivered via lectures, seminars, tutorials, workshops, coursework, group project work and site visits, to give you a fundamental understanding of the social, economic, resource management and legal frameworks within which civil engineering projects take place. Modules are delivered in intensive, week-long blocks, making it easier to combine work and study if you are part-time.

We have extensive laboratories and facilities both on and off our campus for undertaking research in geotechnical engineering, water engineering, wind engineering and structural engineering.

LEARN MORE

For full module information and an online application form, please visit our dedicated web pages, or contact our programme staff with your questions.

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CAREERS

Enhance your professional prospects

A high level of numeracy, and skills in structural engineering problem solving, together with the ability to undertake research, team working, and being conversant with both communication and information technology equips you for a successful career in the structural engineering consultancy or construction industry. Your MSc counts towards achieving Chartered Engineer accreditation.

NEXT STEPS For module information and to apply, visit: **www.birmingham.ac.uk/msc-structural-engineering**

Civil Engineering by Research

PhD/MPhil

Conducting impactful research to transform communities, benefit society and enrich future generations.

FACT FILE

Start Date: Any time, with agreement from supervisor
Duration: PhD 3 years full-time; 6 years part-time. MPhil 2 years full-time; 4 years part-time
Fees for 2020–21: UK/EU – £4,380 full-time, £2,190 part-time; International – £22,500 full-time
Entry requirements: 2:1 Honours degree, or a first degree of a lower classification, along with an MSc/MRes, or evidence of substantial relevant industrial experience

During your pure research degree you will be supported and guided by a supervisor, producing a thesis of original quality, worthy of publication in a learned journal. Our research tackles the problems faced by society today and develops the knowledge and tools to build the communities of the future. Many of our projects have already had a significant impact on society; the impact of others will be felt by generations to come.

Course content

Civil Engineering research programmes are degrees by research alone with a high level of research training, and we are always keen to discuss research opportunities with individuals from a wide variety of backgrounds. Our research supports core themes of Transport, and Resilience and Sustainability. These are clustered into four research groups:

Environmental Engineering

This encompasses the key topics of water engineering, geotechnical engineering and urban living. This is all underpinned by the overriding activity of looking for solutions for a sustainable, resilient future, where we effectively use scarce natural resources.

Fluid Mechanics

This research builds on a fundamental understanding of the motion of fluids – water, air, slurries, waves and weather – in order to address a variety of real-world problems. This allows us to study diverse topics such as wind-induced forces on buildings, vehicle aerodynamics, non-Newtonian fluids in water treatment works, and the behaviour of waves on a beach.

Structural Engineering

This discipline is vital to an efficient and effective development built environment. As urban development and global urbanisation take place, the Structural Engineering group has focused its efforts on structural integrity and serviceability, sustainable design, disaster resilience, structural robustness and innovative structural materials. Working collaboratively with colleagues from academia and industry, we have looked at novel structural materials, energy-producing structures, renewable energy structures and zero-CO_2.

Transport Engineering

Including road usage, design and asset management, materials, sustainable transport, railway engineering, energy efficiency and risk management, this research theme is broad and encompasses most transport systems.

More about the course

Our research benefits from being funded by industry, charities and research councils, which encourages innovative thinking and creates internationally recognised research. We pride ourselves in offering a stimulating research environment and are always keen to discuss research opportunities with individuals from a wide variety of backgrounds.

World-class learning and teaching

We have extensive laboratories and facilities both on and off our campus for undertaking research in geotechnical engineering, water engineering, wind engineering and structural engineering. Advanced computer systems are provided for research into numerical modelling of complex systems and issues associated with resilience. The School has a long tradition of distinguished research that benefits from being funded by industry, charities and research councils. This encourages innovative thinking and creates internationally recognised results.

LEARN MORE

For details of PhD opportunities and an online application form, please visit our dedicated web pages, or contact our programme staff with your questions.

Tel: +44 (0)121 414 4160
Email: pgtengineering@contacts.bham.ac.uk

NEXT STEPS For module information and to apply, visit: **www.birmingham.ac.uk/civil-engineering/research**

This leaflet was written several months in advance of the start of the academic year. It is intended to provide prospective students with a general picture of the programmes and courses offered by the School. Please note that not all programmes or all courses are offered every year. Also, because our research is constantly exploring new areas and directions of study some courses may be discontinued and new ones offered in their place.

Please note the information in this brochure is correct at time of publication but may be subject to change (November 2019).

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