Once you understand Civil Engineering, you will begin to appreciate the challenges that society faces.

Professor Mark Sterling
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Welcome to the School of Civil Engineering

Civil Engineering has been taught at Birmingham since 1875 and through our alumni, academic staff, students and involvement with industry, our influence stretches around the world. We ensure that the work we undertake has real impact and that our students are equipped with the skills they need in an ever changing global workplace. At postgraduate level we offer a comprehensive range of research and taught MSc programmes. We pride ourselves in having created a supportive environment which encourages intellectual growth through academic curiosity and endeavour.

*Professor Mark Sterling*
*Head of the School of Civil Engineering*
Postgraduate students are central to our learning community and make a rich contribution to the academic life and culture of our University. We have over 7,500 postgraduate students drawn from nearly 150 different countries; it is home to one of the largest communities of international students in the UK.

Birmingham is a university rich in high calibre research, with academic staff who are global experts in their field. Here you will be studying with people whose work advances the boundaries of knowledge.

Civil Engineering at Birmingham

Civil Engineering, in all its aspects, is a cornerstone of the development and the sustainability of civilizations. 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 made a significant impact on society, whereas the impact of others will be felt by generations to come. Alumni from our MSc programmes can be found in nearly every country around the world, and are held in high regard by the engineering community.

We are a large and vibrant department with 27 academic staff: experts drawn from around the world. Over 270 students attend undergraduate courses and more than 260 postgraduate taught and/or research students. The School prides itself in the quality of its research, the excellence of its teaching and the pastoral care we provide to every student.

Facilities

We have extensive laboratories and facilities on and off campus for undertaking research in geotechnical engineering, water engineering, wind engineering, railway engineering and structural engineering. In addition to this, a facility to simulate down draughts from thunderstorms, and three half-sleeper rigs for undertaking near full-scale investigations into railway track foundations have recently been commissioned. We also have an aerodynamic moving-model testing facility for high-speed trains and a wind engineering field site at Silsoe in Bedfordshire. Advanced computer systems are provided for research into numerical modelling of complex systems and issues associated with resilience. All our research teams are supported by funding from research councils, industry and other sources.

Research excellence

The School has a long tradition of distinguished research that benefits from being funded by industry, charities and research councils, which encourages innovative thinking and creates internationally recognised results. Our website (www.birmingham.ac.uk/schools/civil-engineering/research/index.aspx) provides a brief overview of recent and ongoing research projects in each area.

Postgraduate study

We have a thriving community of enthusiastic postgraduate students, and we welcome new students who wish to contribute to the advances being made here. We offer a stimulating research environment with structured research training in almost every branch of civil engineering. This enables our graduates to obtain interesting and rewarding careers, whether in industrial practice, industrial research or academia.

Postgraduate programmes

Our portfolio of programmes in Civil Engineering combines: taught programmes, combined research and taught programmes, and doctoral research programmes. With our broad range of academic staff and research skills you will have the opportunity to study subjects that lie between the traditional disciplines or which focus in depth on one particular field.

Taught programmes

MSc, Postgraduate Diploma and Postgraduate Certificate may be studied on a full time or part-time basis and some modules may be studied for continuing professional development (CPD). We offer the following MSc, Postgraduate Diploma and Postgraduate Certificate programmes:

- Civil Engineering
- Civil Engineering and Management
- Construction Management
- Geotechnical Engineering
- Geotechnical Engineering and Management
- Railway Systems Engineering and Integration
- Road Management and Engineering
- Water Resources Technology and Management

Accreditation

The MSc versions of these degrees are accredited as meeting the requirements for Further Learning for a Chartered Engineer (CEng) for candidates who have already acquired an Accredited CEng (Partial) BEng(Hons) or an Accredited IEng (Full) BEng/BSc (Hons) undergraduate first degree.

See www.jbm.org.uk for further information.

Combined research and taught programmes

MRes programmes involve taught classes in your chosen subject and a substantial thesis which accounts for two-thirds of the degree. It provides a first-stage towards doctoral study or a career in research. The following MRes programmes can be studied on either part-time or full-time basis:

- Railway Systems Integration
- Engineering, Sustainability and Resilience

Research programmes

These 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. Research within the School is clustered into two themes – Transport, and Resilience and Sustainability.
### Duration of programmes

- **MSc (Masters)** – 1 year full-time; or on a part-time basis over 2+ years
- **MRes** – 1 year full-time; 2 years part-time
- **MPhil** – 2 years full-time
- **PhD** – 3 years full-time

### Entry requirements

A good Honours degree or equivalent in a relevant subject is the basic requirement. Specific entry requirements for each programme can be found on the following pages, along with programme descriptions. Any academic and professional qualifications or industrial experience you may have are normally taken into account, and in some cases form an integral part of the entrance requirement. To find out what our grade requirements are for a qualification studied in your own country, please see our individual country page information at: www.birmingham.ac.uk/international/students/country.

If your first language is not English, you will also need to have obtained:
- **IELTS 6.0** with no less than 5.5 in any band

Please contact us on [pga-civeng@bham.ac.uk](mailto:pga-civeng@bham.ac.uk) if you are uncertain about the English Language requirements. The University of Birmingham offers short term English language training if required, to attain minimum entry proficiency.

Please be aware that entry to many programmes is highly competitive; consequently we also consider the skills, attributes, motivation and potential for success of an individual when deciding whether to make an offer. After we have received your application you may, if you live in the UK, be invited for an interview or to visit us to discuss your application.

### Taught programmes

**Masters, Postgraduate Diploma and Postgraduate Certificate Programme**

**Structure**
- **Master of Science Degree** (12 months full-time or 24 months part-time)
- **Postgraduate Diploma** (8 months full-time or 16 months part-time)
- **Postgraduate Certificate** (4 months full-time or 8 months part-time)
- **Continuing Professional Development options** (1 or 2 week modules)

Masters (MSc), Postgraduate Diploma (PGDip) and Postgraduate Certificate (PG Cert) may be studied on a full-time or part-time basis. As a result of our teaching method, they are particularly suitable for practicing engineers who wish to study part-time or who may wish to take a single module to earn Continuing Professional Development (CPD) points.

**Patterns of study**

Full-time study requires attendance at the University for eight months (October–May) for the taught modules which comprise of lectures, seminars, tutorials, workshops and site visits (where relevant). Modules are taught in week-long blocks, allowing for part-time students to attend with reduced interruption to their work routine. Taught module blocks are normally followed by a period of self-study time, allowing time for assimilation of knowledge. Between June and September, all masters level students work on their major projects.

Successful completion of four taught modules and one research module leads to the award of a Certificate. Eight taught modules and two research modules results in the award of a Diploma, and completion of 120 taught credits, combined with a dissertation (60 credits) will result in the award of an MSc.

### Continuing Professional Development (CPD)

Several of the modules in many of our programmes are available for CPD purposes. It is possible to complete the directed individual study associated with each module and participate fully in the team exercise activities. In order to be awarded full credits for attendance, CPD delegates also need to pass the end of year examination associated with the module.

### Assessment and awards

Assessment is by a combination of written examination and coursework. Merit and distinction awards are available for those who perform highly in their overall assessment, as well as some university and industry-sponsored prizes.

### Funding

Funding support, awards and scholarships may be available to eligible applicants. Please visit [www.birmingham.ac.uk/students-fees/postgraduate](http://www.birmingham.ac.uk/students-fees/postgraduate) for details.

### How to apply for masters programmes

An application can be submitted online at: [www.apply.bham.ac.uk](http://www.apply.bham.ac.uk)

Admissions enquiries to: [pga-civeng@bham.ac.uk](mailto:pga-civeng@bham.ac.uk), or telephone Mr Dean Moody, Postgraduate Office, on +44 (0) 121 414 5089
MSc, PGDip, PGCert in Civil Engineering
www.birmingham.ac.uk/MScCivilEng

'From one of the UK's best established providers of Civil Engineering Masters education, the University of Birmingham offers a programme which enables students to tailor their own MSc in Civil Engineering. It will provide education and training to pursue a career as a civil engineer, worldwide.'

Professor Andrew Chan, School of Civil Engineering

About the programme
The Birmingham MSc in Civil Engineering is offered for civil engineering and related graduates wishing to enter the profession. With one of the largest ranges of study options it allows you to choose modules in a wide range of subjects in order to tailor your programme of studies to suit your own chosen career.

You will acquire the skills needed to deal with complex issues in practice, making sound judgements and communicating these to specialist and non-specialist audiences. You will develop systematic knowledge and understanding of civil engineering, including emerging technologies, and you will achieve high levels of numeracy in problem-solving, together with research, team working communication and information technology skills. All this will prepare you for a successful career in the civil engineering industry.

The programme is built around our key principles for learning and teaching: to develop and deliver a curriculum that is flexible, distinctive and current, and stimulates students' own natural curiosity. All this is built on nearly 60 years of postgraduate provision in civil engineering.

Programme content
In addition to a 60 credit research project you will study 120 credits of taught modules in the five main core themes of Civil Engineering and Construction:
- Geotechnics
- Structures
- Transport Engineering
- Water

Modules include:
- Individual Research Project
- Finance and Core Skills
- Engineering Structural Dynamics
- Advanced Structures and Design
- Flooding and Water Resource Management
- Water and Wastewater Treatment
- Soil Mechanics
- Ground Engineering
- Construction Management
- Road Asset Management
- Sustainable Construction
- Engineering Production and Risk Management
- Road Design
- Road Financing
- Road Safety
- Sustainable Road Transport

Finance and Core Skills is a compulsory module.

Career opportunities
MSc Civil Engineering graduates will go on to careers world-wide in the civil engineering consultancy or contracting industry, or choose a career in an industry requiring a good understanding of civil engineering issues.

Admission requirements
Applicants for admission to the MSc should normally hold, or be expecting to achieve, a good first degree (Bachelor or Master) or other approved qualification at an equivalent level. This would usually be Civil Engineering or a related discipline. Applications from holders of pertinent non-engineering degrees will be welcome. Relevant post-graduate experience in industry will also be taken into account in considering applications.

Applicants with CEng and IEng qualifications or equivalent, but without a degree, are also invited to apply.
MSc, PGDip, PGCert in Civil Engineering and Management
www.birmingham.ac.uk/MScCivilEngMan

‘Success of major civil engineering construction requires excellence of design coupled with good management’.
Dr Pedro Martinez-Vazquez, School of Civil Engineering.

Career opportunities
Being flexible in its nature, this MSc in Civil Engineering and Management permits every student to tailor the programme of studies to suit their own chosen career, benefiting from the range of specialist modules available to all MSc students. Flexibility also means that graduates of non-civil engineering disciplines may be eligible for study: please enquire if this applies in your particular case and the School will make an assessment based on previous study and experience.

Admission requirements
Applicants for admission to the MSc should normally hold, or be expecting to achieve, a good first degree (Bachelor or Master level) or other approved qualification at an equivalent level. This would usually be Civil Engineering or a related discipline. Applications from holders of pertinent non-engineering degrees will be welcome.

Relevant post-graduate experience in industry will also be taken into account in considering applications and holders of CEng and IEng qualifications or equivalent, but without a degree, are also invited to apply.

This programme is commencing in September 2013 and we are applying for accreditation.

Learn more
Please visit our website at www.birmingham.ac.uk/MScCivilEngMan for up to date accreditation information.
MSc, PGDip, PGCert in Construction Management

www.birmingham.ac.uk/MScConMan

'Effective construction management is to apply advanced management technology and skills to ensure that the project is completed on time and to budget, and performs as required.'

Dr Min An, School of Civil Engineering

About the programme
This highly popular MSc programme addresses construction management in its widest sense and emphasises the demands of sustainable construction and project risk management in the industry. Since its inception in 1975 over 1000 students have benefited and alumni are found in the construction industry worldwide. Management skills are in great demand across a wide range of industrial sectors, both public and private from house building and plant to infrastructure works. The purpose of the programme is to provide advanced training to engineering graduates, professional civil engineers and other non-engineering graduates who wish to specialise in management in the construction sector.

The programme is built around our key principles for learning and teaching: to develop and deliver a curriculum that is flexible, distinctive and current, and stimulates students’ own natural curiosity. Expert visiting lecturers from the engineering and construction industry enhance the programme with insights and experience.

Programme content
In addition to a 60 credit research project you will study 120 credits of taught modules including:

- Human Resources
- Construction and Project Planning
- Contract Procedures
- Financial Management
- Lean Construction
- Risk Management
- Sustainable Construction and Lifecycle Assessment

Career opportunities
MSc Construction Management graduates are held in high regard by the construction industry world-wide, as demonstrated by an exemplary record of graduate employment. Professional construction and project managers can expect to play leading roles in a professional capacity in design, construction and project management organisations in the UK and overseas.

Admission requirements
The programme is suitable for graduates employed in civil engineering design and/or construction. It is primarily intended for early to mid-career training, to enable practising civil engineers and other professionals aspiring to high management positions in public and private organisations, to upgrade their knowledge and develop management skills applicable to the construction industry. Graduates from disciplines other than civil engineering are welcome and the programme is adapted to take account of changes and developments in the industry.
About the programmes
The Birmingham MSc in Geotechnical Engineering and Management provides advanced education and management skills to students who aim to become geotechnical and foundation engineers. Over 800 students have graduated since its inception in 1956.

The programme is intended for civil engineering and geology graduates who wish to widen their professional scope or to specialise in geotechnical engineering whilst developing a range of key managerial skills. It is relevant to individuals from all areas of the construction industry, including consultancy, contracting, local authority and other construction professionals. This programme is continually updated to meet the ever-changing environment faced by geotechnical engineering, underpinned by excellence in research with strong links from industry. Graduates often secure employment long before they graduate or use it as a stepping stone in their career development.

Programme content
In addition to a 60 credit research project you will study 120 credits of taught modules, including:
- Properties of Rocks and Soils
- Engineering Geology
- Soil Mechanics
- Ground Engineering
- Foundation Engineering
- Slopes and Retaining Structures
- Research Skills
- Geomechanics

Construction management
All of these aim to develop a depth of scientific understanding, management problem-solving and industrial experience. Local companies support the programme by providing visiting lecturers, materials and access for site visits on a regular basis.

All students are required to attend the Midland Geotechnical Society lectures, which are normally held monthly at the University.

Career opportunities
Graduates are held in high regard by the geotechnical and related industry, as demonstrated by regular 100% record of employment each year. They may join a specialist geotechnical engineering company or a general engineering organisation, as a specialist engineer in this area. Some of the most senior positions in industry are filled by graduates of this programme and industry prizes are regularly awarded to graduates.

Admission requirements
Applicants for admission to these programmes should normally hold, or be expecting to achieve, a good first degree (Bachelor or Master) or other approved qualification at an equivalent level in an appropriate discipline (for example, Engineering, Sciences, Geology, Geography or Mathematics). Relevant experience in industry may also be taken into account in considering applications.
MSc, PGDip, PGCert in Railway Systems Engineering and Integration

www.birmingham.ac.uk/MScRailway

‘Railways have a key role in sustaining and enhancing the economic and social fabric of cities, regions and whole countries, at minimal cost to our environment.’

Dr. Gurmel S Ghataora, School of Civil Engineering

About the programme
Railway Systems Engineering and Integration (RSEI) has been taught at the University since 2005 and is one of a range of programmes offered by the Birmingham Centre for Rail Research and Education.

This programme offers truly interdisciplinary postgraduate study. The main objective of the course is to encourage a thorough understanding of the principles involved in developing, designing and operating modern railway systems, as well as to develop in postgraduates a robust understanding of the issues involved in interface management for both existing and new railway systems. The programme has a strong focus on developing individuals’ railway engineering and management knowledge, their system integration skills and their ability to work in focused project teams.

Many participants are experienced railway engineers and managers, sponsored by their own employers, but the programme also allows new entrants to the railway industry to familiarise themselves with the specialist disciplines involved in railway systems, while gaining a strong understanding of the complex interactions between the subsystems.

Programme content
In addition to a 60 credit industry-related or university-based research project, MSc modules cover the following topics during the programme, in depth:
- Strategic Management of Railway Operations
- Railway Rolling Stock Systems Design
- Railway Traction Systems Design
- Systems Engineering and Integration for Dependability
- Railway Infrastructure and Track Systems
- Train Control Systems Engineering
- Railway Economics and Strategic Management of Technology
- Ergonomics and Human Factors for Railways

Railway engineering specialists and senior managers active in the railway industry are members of the faculty and contribute recent discoveries and knowhow in lectures. This represents about 50% of the contact time on the programme, ensuring up-to-date course content. Many of the industry contributors are employed by sponsors of the programme, such as Atkins, Bechtel, Bombardier, Deltarail, Halcrow, London Underground, Network Rail, Swiss Federal Railways, Tubelines and Virgin Trains.

Career opportunities
RSEI graduates often return to their sponsoring companies in more senior roles, as many participants study on a part-time basis. Others will join rail organisations or the relevant department of a larger engineering company. Many senior managers and directors in the industry, world-wide, are graduates of this programme.

Admissions requirements
This programme for the railway industry is intended for new graduates, practicing railway engineers and engineering managers from all disciplines and functional specialisations. The part-time version is structured in such a way as to allow attendance by students from Britain, continental Europe and overseas, without affecting their ability to play a full role at their place of work. The full-time programme suits graduates who wish to enter the railway industry and professionals working in the industry who wish to up-skill in the shortest possible time.

How to apply
Admissions enquiries for Railway Systems Engineering and Integration:
Mrs Joy Grey +44 (0)121 414 4342 or email j.grey@bham.ac.uk
About the programme
The MSc in Road Management and Engineering is one of the world’s leading programmes in highway management and engineering. Since 1963 more than 2,000 students have benefited from this programme and some of the most senior positions in industry are filled by its graduates.

The programme provides advanced education for engineers aspiring to higher or middle-management positions in private and public sector road engineering organisations. The course attracts participants from all over the world, including practicing engineers who wish to gain knowledge of the state of the art in road management or change career paths as well as recent graduates who want to pursue a career in road management.

Programme content
You will study 120 credits of taught modules on engineering and management topics, plus a 60 credit research project. The engineering modules cover the principles of highway capacity and geometric design:

- Junction capacity and design
- Pavement materials
- Road safety
- Road drainage
- Structural design of road pavements

Management focused modules complement the range of subjects taught in the engineering oriented modules and include: sustainable transport policy, Road economics, HDM-4, Road asset management and Road Maintenance.

All of these aim to develop a depth of scientific understanding, management problem-solving and industrial experience of highway engineering and design.

Career opportunities
The programme is intended for graduates who aim to be future leaders in organisations responsible for the planning, budgeting, design and maintenance of highway networks. MSc Road Management and Engineering graduates are held in high regard and many of today’s senior executives in road authorities throughout the world are graduates are sought after by local authorities, highways agencies, public works departments, government agencies, international donor agencies and consulting engineers specialising in the road sector. Many graduates go on to become senior executives in road authorities throughout the world.

Admission requirements
Applicants for admission to the MSc should hold, or be expecting to achieve degree equivalent to UK 2.1 honours degree in an appropriate discipline (for example, Engineering, Sciences, Geology, Geography or Mathematics). Relevant post-graduate experience in industry will also be taken into consideration.
MSc, PGDip, PGCert in Water Resources Technology and Management (WRTM)

www.birmingham.ac.uk/MScWRTM

'Water is crucial for economic and social development. Properly managing water resources is essential for maintaining healthy ecosystems and sustainable development.'

Dr Xiaonan Tang, School of Civil Engineering

About the programme

This MSc programme has provided education to over 800 students since its inception in 1965. Some of the most senior positions in industry are filled by graduates of this programme.

The Birmingham MSc in Water Resources Technology and Management provides advanced instruction to students who aim to become specialist water resources scientist, managers and engineers.

The programme is intended for graduates with a scientific (e.g. chemistry, earth sciences, geography, mathematics, physics) or engineering background who wish to develop a specialist knowledge in water resources technology and management. The programme is relevant to recent graduates and those with some industrial experience and it provides a sound knowledge in water resources science, technology and management.

Programme content

In addition to a 60 credit research project you will study 120 credits of taught modules, covering:

- Hydrology
- Flooding and Water Resource Management
- Water Distribution Pipeline Network Analysis
- River Flow Fundamental
- Water Quality Management
- Water and Wastewater Treatment
- Water and Environmental Management
- Management and Research Techniques

All of these aim to develop a depth of scientific understanding, management problem-solving and industrial experience of the water engineering industry.

Career opportunities

MSc Water Resources Technology and Management graduates will go on to careers world-wide in the environmental regulation agencies, water companies, government ministries, environmental and engineering consultants or they may continue with research. Students who complete the programme are held in high regard by the water industry, as demonstrated by an almost 100% record of employment. The programme benefits from significant contribution to by such organisations as the Environment Agency, Halcrow, HR Wallingford, Jeremy Benn Associates, Jacobs, Mott MacDonald, OFWAT, Severn Trent Water, South Staffs Water, Thames Water, United Utilities, Atkins and WRc Ltd.

Admission requirements

Applicants for admission to the MSc should normally hold, or be expecting to achieve, a good first degree or other approved qualification at an equivalent level in an appropriate discipline (for example, Engineering, Sciences, Geology, Geography or Mathematics). Relevant experience in industry may also be taken into account in considering applications.
What our former students say...

‘I came in to the MSc with a Degree in Applied Geology with the presumption I may struggle with the mathematics involved in the course. This was not the case due to the help from the lecturers and demonstrators, the lecturing team are not only innovative engineers but great teachers. I now work in underground coal mining and used the taught course content from day one.’

*Hamzh Al-Azzani, former MSc Civil Engineering student*

‘Coming from a construction management background, I wanted exposure to all elements of civil engineering. This was exactly what the University of Birmingham delivered… A few of the modules were run by professionals from the industry. This fostered a greater understanding of how industries work and inevitably, prepared me with what to expect once I left the University.’

*Tom Roper, Site Geotechnical Engineer with PIMS group, Australia*

‘I already had a number of years’ experience in Highways Engineering field when I joined the MSc programme of Road Management and Engineering in the University of Birmingham and I think it was the best step I took to enhance my professional career. Curriculum of the course was very well planned, well delivered and covered all the aspects that a Highway Manager needs to be aware of to manage the road assets efficiently. The course was extremely helpful to enhance knowledge and confidence to manage large road projects independently and following the successful completion of the course my responsibility at work has been increased significantly. The course had a truly global perspective and also provided the opportunity to meet people from different parts of the World.’

*Rana Ghosal, former student*

‘A challenging but worthwhile experience.’

*Joshua Pragas, former student*

‘Holding a full-time job and studying in my free time was never easy because it required a lot of sacrifices and strategic planning which often led to very difficult trade-offs. Nonetheless, when I factor in the fun I had on the course, the great people I met and the wealth of knowledge I learnt, the benefits were priceless in the long run! My eyes were finally opened and I could see roads in a completely new light, which was when I discovered my new passion for a career in International Development…’

*Mike Butler, RME graduate 2011*

‘Graduating from the MSc Programme in Railway Systems Engineering and Integration at UoB has been a heaven-sent key to open the doors to a holistic understanding of the complex railway business.’

*Merve Mercimek, former student*
MRes programmes are aimed at high calibre students who wish to develop and apply techniques appropriate for industrial or academic careers at the cutting-edge of research and development. MRes can be studied on a one year full time (or a two year part-time where available) basis.

These are combined taught and research programmes that contain taught elements alongside training in research skills and methodology. The programmes require the production of a final dissertation or thesis of up to 20,000 words on a specific research topic.

The School of Civil Engineering offers two MRes programmes:

- Engineering Sustainability and Resilience
- Railway Systems Integration

MRes Engineering Sustainability and Resilience

www.birmingham.ac.uk/MResSustainability

This research-based programme provides academic training and research-based learning that is necessary for future leaders in many areas of engineering. When designing, constructing and operating the built environment there are many, potentially conflicting, decisions to be made, and many scenarios for the future landscape of urban living. This programme will help students to achieve a built environment that is flexible and efficient regardless of which future actually emerges.

The main component of this programme is a research project, which provides structured training in research. Usually carried out with industrial involvement, with some time spent in the collaborating organisation, this programme includes study within your area of interest within the theme of engineering resilience and sustainability.

In addition to the research project, worth 120 credits, all students will take the following modules:

- Research skills and research environment
- Sustainable Construction

Plus options which include:

- Construction Management
- Engineering Geology
- Foundation Engineering
- Site Investigation
- Waste Management
- Water and Environmental Management
- Applied Fluid Mechanics for Civil Engineers
- Ground Engineering
- Soil Mechanics
- Maintenance of Roads and Bridges
- Road Asset Management
- Road Design Safety and Environment
- Road Economics and Finance
- Water and Wastewater Treatment
- Flooding and Water Resource Management
- Engineering Production and Risk Management in Construction

This list is not exhaustive and other modules available at the university may be substituted if appropriate for the research project being undertaken.

Career opportunities

MRes graduates have unique skills in applied research and are therefore in demand in industrial research groups, or they may continue to further their research careers, via PhD study.

Admission requirements

Applicants for admission to the MRes should normally hold, or be expecting to achieve, a good first degree or equivalent approved qualification. Relevant post-graduate experience may also be taken into account.

Scholarships and funding

We have several research council studentships, bursaries and postgraduate scholarships available, most of which provide full funding and some of which are enhanced by industrial funding where the topic has a specific industrial relevance. Other sources of funding are the EPSRC, the BBSRC, the Knowledge Transfer Partnership (KTP), the European Union and industrial funding for UK and EU students.

International students can often gain funding through Commonwealth scholarships or their home government.

The School also offers the William Lardner award, worth up to £9,000 to selected MRes students.

How to apply

An application can be submitted online at: www.apply.bham.ac.uk

Programme enquiries to:
Bill Ling, Tel: +44 (0)121 414 5148, Email: t.ling.1@bham.ac.uk

Admissions enquiries to:
Miss Helen Booth, +44 (0)121 414 4160, Email: h.r.booth@bham.ac.uk
I thoroughly enjoyed studying on the MSc course, and found the whole Birmingham University experience challenging and highly rewarding, both in terms of what was learnt and its practical application in my profession. I would highly recommend it to any person seeking to develop themselves within the railway industry.’

Clive Cashin, former student

MRes Railway Systems Integration

www.birmingham.ac.uk/MResRailway

This is one of a range of programmes offered by the Birmingham Centre for Railway Research and Education (BCRRE). The programme allows students to carry out a substantive research project, usually in collaboration with industry, whilst learning more about specific technical and managerial issues relevant to the railway industry.

This is an interdisciplinary programme that combines a major research project with technical studies that build on prior academic study or industrial experience in a relevant subject area. It gives students the opportunity to benefit from the fundamental and applied research being conducted in the Birmingham Centre for Railway Research and Education. The programme allows students to research a technical, social or economic problem associated with the railway industry. Projects are usually undertaken in collaboration with industry. At the same time, students learn more about specific technical and management issues relevant to the railway industry.

As a result, students gain an understanding of the most recent developments in railway research. The results of their work often satisfy the industry’s needs for new and emerging technologies, as well as the approaches needed to apply these developments.

Programme content
In addition to the research project, worth 120 credits, all students study topics related to Research Skills and the Research Environment, plus a selection of one or two technical modules from the following list:
- Railway Rolling Stock Systems Design
- Railway Traction Systems Design
- Railway Infrastructure and Track Systems
- Train Control Systems Engineering
- Ergonomics and Human Factors for Railways

Additionally, students must choose either one or two management modules from the following list, to complement the choice of technical modules:
- Strategic Management of Railway Operations
- Systems Engineering and Integration for Dependability
- Railway Economics and Technology Management

Career opportunities
Graduates of this MRes programme have unique skills in applied research and are therefore in demand in industrial research groups, or they may continue to further their research careers, via PhD study.

Admission requirements
The normal entrance qualification for MRes study is at least an upper second-class Honours degree, or equivalent.

Scholarships and studentships
Several research council studentships, bursaries and postgraduate scholarships are available, most of which provide full funding and some of which are enhanced by industrial funding, where the topic has a specific industrial relevance. International students can gain funding through Overseas Research Scholarships, Commonwealth scholarships or their home government.

How to apply
An application can be submitted online at: www.apply.bham.ac.uk

Programme enquiries to:
Professor Chris Baker, +44 (0)121 414 5067.
Email c.j.baker@bham.ac.uk

Admissions enquiries to:
Mrs Joy Grey, +44 (0)121 414 4342.
Email: j.grey@bham.ac.uk
Doctoral Research Programmes

[www.birmingham.ac.uk/schools/civil-engineering/research/index.aspx](http://www.birmingham.ac.uk/schools/civil-engineering/research/index.aspx)

These are degrees by research alone, with a high level of research training. Working closely with the support and guidance of a supervisor, you will produce a thesis, which at PhD level is a work of original scholarship worthy of publication in a learned journal.

<table>
<thead>
<tr>
<th>Your thesis is usually required to be between 50,000 and 80,000 words. Research degrees can start at any time during the academic year in agreement with your supervisor.</th>
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</thead>
<tbody>
<tr>
<td><strong>Entry requirements</strong></td>
</tr>
<tr>
<td>The normal entrance qualification for PhD study is either at least an upper second-class Honours degree, or a first degree of a lower classification, along with an MSc/MRes, or evidence of substantial relevant industrial experience.</td>
</tr>
<tr>
<td><strong>Scholarships and funding</strong></td>
</tr>
<tr>
<td>Several research council studentships, bursaries and postgraduate scholarships are available for MPhil and PhD students, most of which provide full funding and some of which are enhanced by industrial funding, where the topic has a specific industrial relevance. Other sources of funding are the EPSRC, the BBSRC, the Knowledge Transfer Partnership (KTP), the European Union and industrial funding for UK and EU students. International students can often gain funding, Commonwealth scholarships or their home government.</td>
</tr>
<tr>
<td><strong>Programme overview</strong></td>
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<tr>
<td>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. Research within the School is clustered into two themes – Transport; and Resilience and Sustainability. It 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.</td>
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### Transport Technology

[www.birmingham.ac.uk/research/activity/civil-engineering/transport/index.aspx](http://www.birmingham.ac.uk/research/activity/civil-engineering/transport/index.aspx)

A healthy public transport system is fundamental to the prosperity of any nation. Within the UK, the road and rail network is at the heart of this and raises scientific questions, on its reliability, its future and the effects of climate change on transport systems – its use and its development.

Transport based research at the University of Birmingham has a long history, dating back to the 1960s. Research in highway engineering makes strong advances in pavement structural performance and highway capacity, design, deterioration modelling and maintenance.

Railway engineering is underpinned by the multi-disciplinary Birmingham Centre for Railway Research and Education (BCRRE).

### Railway Engineering

Within Britain, the rail network is at the heart of the transportation infrastructure. Its reliability, its future and the management of the effects of climate change on the use of railway systems are key to ensuring the network’s future success. BCRRE brings together a multidisciplinary team from across the university to tackle fundamental railway engineering problems. The team actively engages with industry, other universities through Rail Research UK Association, and international partners.

BCRRE also delivers the MSc programme in Railway Systems Engineering and Integration and the MRes programme in Railway Systems Integration, as detailed earlier in this brochure.

There are six main areas of research within BCRRE, covering all aspects of railway engineering:
- Aerodynamics and Environment
- Capacity Management
- Monitoring and Decision Support
- Materials and Testing
- Traction and Energy
- Systems and Control

### Transport and Sustainability

Research in this area includes: long term large scale change and transitions to sustainability; behavioural change; the role of walking and cycling in sustainable transport policy and how these modes might be enhanced; environmental impacts of transport and transport infrastructure, including climate change and local air pollution; road safety and risk, especially consideration of human factors, behaviour and engineering solutions; equity issues in transport; global issues.

### Contact information

For information regarding research opportunities in the field of Transport and Sustainability please contact:

Professor Miles Tight, +44 (0)121 414 5071.
Email: m.r.tight@bham.ac.uk.

For full details on the research topics, please see [www.birmingham.ac.uk/research/activity/railway](http://www.birmingham.ac.uk/research/activity/railway)
Road Management and Engineering

Research in Road Management and Engineering includes road asset management, road management and investment assessment systems, road economics and financing, road development and strategic planning, road maintenance and operations, road safety, road administration, energy use and vehicle emissions, social benefits from road investments, pavement design and analysis, the development of long-term prediction relationships, data collection and analysis methods, data integrity and information quality.

Research in highway management and engineering informs the MSc programme in Road Management and Engineering. The Group also delivers Continuing Professional Development (CPD) courses such as the Senior Roads Executive Programme (SREP) and other bespoke courses and workshops in the areas of road management and financing.

Contact Information

For information regarding research opportunities in Highway Management and Engineering, please contact:
Dr Michael Burrow, +44 (0)121 414 2626.
Email: m.p.burrow@bham.ac.uk

Vehicle Aerodynamics

Research in vehicle aerodynamics concentrates on the behaviour of road and rail vehicles in cross winds, the development of early warning systems for high winds, investigations of the slipstreams and wakes of vehicles, and the effect of transient pressure loading on train structures due to other trains passing and the passage through tunnels.

Recent work in this area at the University of Birmingham has concentrated on the effects of cross winds on road and rail vehicles, the effects of vehicle slipstreams and the dispersion of pollutants in the wake of vehicles.

Contact Information

For information regarding research opportunities in the field of Vehicle Aerodynamics please contact:
Professor Chris Baker, +44 (0)121 415 5067.
Email: c.j.baker@bham.ac.uk

Safety and Reliability Management

This research theme focuses on target risk and reliability, safety-cost analysis based decision making, life cycle analysis, uncertainty analysis, safety-critical software assessment, dynamic and static finite element analysis, and overall safety case preparation for industry. It transfers research in risk and reliability from the construction industry into the transport industry.

Contact Information

For more information regarding research opportunities in the area of Safety and Reliability Management, please contact:
Dr Min An, +44 (0)121 414 5146.
Email: m.an@bham.ac.uk

Resilience and Sustainability

Our ability to respond in a sustainable way to the challenges that we and future generations face is at the core of this theme. These challenges may be posed by climate change, regulation and natural disasters, and how we adapt our existing cities to ensure that they are future-proof, gives a flavour of the type of research questions we are concerned with. However, unlike traditional approaches, we do not restrict ourselves to considering only the structural engineering options; instead we endeavour to ensure that non-structural measures are at the heart of our thinking.

Two distinct research areas emerge:
- **Long-term resilience** of the built environment and built infrastructure, i.e., the sustainability of the physical infrastructure into the far future, notably in delivering utility service provision, and
- **Short-term resilience** of the built environment and built infrastructure to natural hazards, the severity and frequency of which is often increasing due to climate change

Research topics in resilience and sustainability include:
- Geotechnical Engineering
- Environmental Engineering
- Risk and Reliability Management
- Structural Engineering
- Wind Engineering and Aerodynamics
- Water Engineering
- Highways Management
- Computation Engineering and Modelling

Contact Information

For more information about research opportunities in the area of Resilience and Sustainability please contact:
Dr John Bridgeman, +44 (0)121 414 3071.
Email: j.bridgeman@bham.ac.uk
Further information

Accommodation
The University has a large amount of accommodation although most of our research students prefer to make their own arrangements for accommodation. First-year international postgraduate students who are new to Birmingham are guaranteed a place in University accommodation, subject to certain conditions. For more information visit: www.has.bham.ac.uk/studentaccom

Sporting facilities
Birmingham offers some of the best sports facilities in the country, supported by professional coaching and imaginative programmes that give you a vast choice of sporting opportunities to suit your taste and ability. For more information visit: www.sport.bham.ac.uk

The Guild of Students
As the first purpose-built students’ union in the country, Birmingham’s Guild of Students is the hub of University life. Its mission ‘to enhance the student experience’ is achieved through a wide range of activities, services, societies and social events. With cafes, restaurants, nightclubs, shopping outlets, support and welfare services, the Guild provides representation, help and a variety of social activities for students. For more information visit: www.guildofstudents.com

The city of Birmingham
Around £9 billion has been ploughed into the city centre over the past 20 years and Birmingham continues to attract significant investment. The landscape of the area has changed, and stylish apartments and offices have replaced factories and warehouses. An astounding £800 million and 8,000 jobs were brought into the City of Birmingham’s economy through the construction of the Bullring shopping centre alone.

Entertainment, arts and culture
Famous for its industrial past, Birmingham has also long been noted for its cultural heritage. The Hippodrome, Alexandra and Birmingham Repertory Theatres between them stage touring dramas and West End shows, ballets, operas, pantomimes and stand-up comedy.

In addition to theatres, there is an excellent choice of cafes and restaurants providing culinary experiences from a variety of cultures, most notably in the Balti Triangle and the Chinese Quarter. There are museums, cinemas, nightclubs, pubs and wine bars in abundance.

If you like live entertainment, then take your pick from comedy clubs, local music gigs and top shows at Birmingham’s principal theatres. The National Exhibition Centre and the National Indoor Arena regularly showcase star names from the worlds of rock, pop and sport. The world famous City of Birmingham Symphony Orchestra (CBSO) has its home in Symphony Hall.

Sport
Birmingham is home to Premier League football and international athletics at Alexander Stadium and in recent years it has staged more sporting championships than any other UK city. Edgbaston cricket ground, home to Warwickshire Country Cricket Club close to the University regularly hosts test matches and international tournaments including the Cricket World Cup. The city also boasts many golf courses, including The Belfry, which has hosted the Ryder Cup four times. In the summer of 2012 Birmingham was the home base and training venue for the USA and Jamaican Olympic athletics teams.

Shopping
Bullring shopping centre is one of Europe’s largest city retail development and includes the award-winning, iconic, Selfridges building. The Mailbox development houses a wide range of designer chains, including Harvey Nichols.

Birmingham hosts four major markets, as well as all the principal chain stores. There is also a wealth of smaller shops and retail centres, where you can find everything from fresh herbs and spices for authentic international dishes, to hand-crafted jewellery made in the Jewellery Quarter.

The heart of England
Located in the heart of the country, Birmingham has so much to offer visitors. With Warwickshire, the Malvern Hills and the Ironbridge Gorge all nearby, you are never more than a short drive from some of the UK’s most scenic countryside.

Birmingham is at the centre of the motorway, rail and canal network, with its own international airport – you can get almost anywhere in the world from here.