

Railway Systems Integration MRes

Postgraduate combined research and teaching degree programme Railway Systems Integration MRes:

Railway businesses rely on advanced technical and operational systems to carry vast numbers of passengers in densely populated areas and large quantities of goods over long distances. The Master of Research (MRes) programme in Railway Systems Engineering and Integration prepares postgraduates for careers in research and development (R&D) in railway businesses and companies supplying railways with advanced technical and operational systems. The programme can also serve as a stepping stone to doctoral studies by developing candidates' analytical skills and research know-how.

Graduates of the programme develop sophisticated technical subsystems and control the complex interfaces that characterise existing and new railways. The full-time programme comprises 3 classroom taught technology oriented modules and a research skills module that consists of three main elements, namely, reviewing literature, analysing data and modelling the behaviour of technical systems. Two thirds of the period of study are devoted to independent research that is documented in a substantial thesis. Part-time students follow the same syllabus as full-time students but complete the taught modules and the thesis in a sequence that best suits their work commitments.

- [Scholarships in Master of Research in Railway Systems Integration \(/schools/civil-engineering/news/scholarships-mres-railway-systems.aspx\)](/schools/civil-engineering/news/scholarships-mres-railway-systems.aspx)

[Study here and find out why the University of Birmingham was awarded The Times and The Sunday Times University of the Year 2013-14 \(http://www.birmingham.ac.uk/news/latest/2013/09/20-sep-Birmingham-announced-as-University-of-the-Year.aspx\)](http://www.birmingham.ac.uk/news/latest/2013/09/20-sep-Birmingham-announced-as-University-of-the-Year.aspx)

Course fact file

Type of Course: Combined research and taught

Study Options: Full time

Duration: 1 year full-time or 2 years part-time

Start date: September

Contact

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[School of Civil Engineering \(/schools/civil-engineering/index.aspx\)](/schools/civil-engineering/index.aspx)

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Details

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 will gain an understanding of the most recent developments in railway research; the industry's needs for new and emerging technologies; and techniques in which 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 for 30 credits. The remainder will be a selection of one or two technical modules from the following list (each worth 10 credits):

- 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 (each worth 10 credits) to complement the choice of technical modules:

- Strategic Management of Railway Operations
- Systems Engineering and Integration for Dependability
- Railway Economics and Technology Management

- [Civil Engineering postgraduate degree courses \(/schools/civil-engineering/postgraduate/index.aspx\)](http://schools/civil-engineering/postgraduate/index.aspx)
- [Birmingham Centre for Railway Research and Education \(/research/activity/railway/index.aspx\)](http://research/activity/railway/index.aspx)

Fees and funding

Tuition fees for home/EU students (2015/2016)

Research programmes (including Masters by research) **£4,090***

*Research fees are yet to be confirmed by Research Councils UK, and may change.

Part-time programmes

Most part-time programmes run for two years and their fees are one half of the standard full-time programme fees.

Tuition fees for international students (2015/2016)

International student tuition fees are set at **£17,365**.

For further information please view the [fees for international students \(http://www.birmingham.ac.uk/international/students/finance/fees.aspx\)](http://www.birmingham.ac.uk/international/students/finance/fees.aspx) page.

Part-time programmes

UK student visa regulations mean that students classed as overseas for fees purposes may normally only register on a full-time basis.

Learn more about [fees and funding \(/postgraduate/pgt-fees/fees.aspx\)](http://postgraduate/pgt-fees/fees.aspx)

[\(/postgraduate/pgt-fees/fees.aspx\)](http://postgraduate/pgt-fees/fees.aspx)

Scholarships and studentships

- [Scholarships in Master of Research in Railway Systems Integration \(/schools/civil-engineering/news/scholarships-mres-railway-systems.aspx\)](http://schools/civil-engineering/news/scholarships-mres-railway-systems.aspx)

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. 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 overseas research scholarships, Commonwealth scholarships or their home government.

For further information contact the School directly or email [sfo@contacts.bham.ac.uk \(mailto:sfo@contacts.bham.ac.uk\)](mailto:sfo@contacts.bham.ac.uk)

Entry requirements

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

Learn more about [entry requirements \(/postgraduate/requirements-pgt/index.aspx\)](http://postgraduate/requirements-pgt/index.aspx)

International entry requirements

We accept a range of qualifications from different countries – learn more about [international entry requirements \(/postgraduate/requirements-pgt/international/index.aspx\)](http://postgraduate/requirements-pgt/international/index.aspx)

[\(/postgraduate/requirements-pgt/international/index.aspx\)](http://postgraduate/requirements-pgt/international/index.aspx)

[Standard English language requirements \(/postgraduate/requirements-pgt/international/index.aspx\)](http://postgraduate/requirements-pgt/international/index.aspx) apply

How to apply

Learn more about [applying \(/postgraduate/courses/apply-pg/index.aspx\)](http://postgraduate/courses/apply-pg/index.aspx)

[Apply now \(https://pga.bham.ac.uk/lpages/EPSo63.htm\)](https://pga.bham.ac.uk/lpages/EPSo63.htm)

When clicking on the Apply Now button you will be directed to an application specifically designed for the programme you wish to apply for where you will create an account with the University application system and submit your application and supporting documents online. Further information regarding how to apply online can be found on the [How to apply pages \(http://www.birmingham.ac.uk/students/courses/postgraduate/apply-pg/index.aspx\)](http://www.birmingham.ac.uk/students/courses/postgraduate/apply-pg/index.aspx)

[Apply now \(https://pga.bham.ac.uk/lpages/EPSo63.htm\)](https://pga.bham.ac.uk/lpages/EPSo63.htm)

Related links

[MRes Railway Systems brochure \(pdf\) \(/Documents/college-eps/civil/brochure/MRES-railway-systems.pdf\)](http://Documents/college-eps/civil/brochure/MRES-railway-systems.pdf)

[Birmingham Centre for Railway Research and Education \(/research/activity/railway/index.aspx\)](http://research/activity/railway/index.aspx)

[Postgraduate degree courses in Civil Engineering at Birmingham \(pdf 1 MB\) \(/Documents/college-eps/civil/brochure/postgraduate-courses-civil-engineering.pdf\)](http://Documents/college-eps/civil/brochure/postgraduate-courses-civil-engineering.pdf)

Related news and events

[£6000 Scholarships in Master of Research in Railway Systems Integration \(/schools/civil-engineering/news/scholarships-mres-railway-systems.aspx\)](http://schools/civil-engineering/news/scholarships-mres-railway-systems.aspx)

[Engineering students build UK's first hydrogen powered locomotive \(/news/latest/2012/08/21-Aug-12-Engineering-students-build-UKs-first-hydrogen-powered-locomotive.aspx\)](http://news/latest/2012/08/21-Aug-12-Engineering-students-build-UKs-first-hydrogen-powered-locomotive.aspx)

[Birmingham Centre for Railway Research and Education - Connecting with research prizes \(/schools/civil-engineering/news/archive/research-prizes.aspx\)](http://schools/civil-engineering/news/archive/research-prizes.aspx)

[LivingRail research award for Professor Baker \(/schools/civil-engineering/news/baker-grant-award.aspx\)](http://schools/civil-engineering/news/baker-grant-award.aspx)

[Rising to the 'Ultimate3' challenge \(/schools/civil-engineering/news/archive/ultimate-3-challenge.aspx\)](http://schools/civil-engineering/news/archive/ultimate-3-challenge.aspx)

[Transport Secretary visits Railway Centre \(/schools/civil-engineering/news/archive/transport-secretary-visits.aspx\)](http://schools/civil-engineering/news/archive/transport-secretary-visits.aspx)

[An entente cordiale of railway engineers - Civil Engineering \(/schools/civil-engineering/news/archive/railway.aspx\)](http://schools/civil-engineering/news/archive/railway.aspx)

[University of Birmingham launches new railway research institute in China \(/news/latest/2013/09/16-Sep-University-of-Birmingham-launches-new-railway-research-institute-in-China.aspx\)](http://news/latest/2013/09/16-Sep-University-of-Birmingham-launches-new-railway-research-institute-in-China.aspx)

[Aspiring engineers go 'on the rails' at residential course \(/schools/civil-engineering/news/archive/go-on-the-rails.aspx\)](/schools/civil-engineering/news/archive/go-on-the-rails.aspx)

[International rail conference speeds into Birmingham \(/news/latest/2014/12/international-rail-conference-04-12-14.aspx\)](/news/latest/2014/12/international-rail-conference-04-12-14.aspx)

[University to play key role in training of HS2 engineers \(/news/latest/2014/09/training-of-hs2-engineers-30-09-14.aspx\)](/news/latest/2014/09/training-of-hs2-engineers-30-09-14.aspx)

Learning and teaching

The **Birmingham Centre for Railway Research and Education** (<http://www.railway.bham.ac.uk>) is a cross-disciplinary centre, mainly involving staff from the Schools of Civil, Electrical and Materials Engineering, and also staff from a number of other Schools across the industry. Its purpose is to carry out fundamental and applied research in railway science and technology and to provide high level educational opportunities in these fields.

The centre's research activities include railway aerodynamics and climatology, railway geotechnics, risk management, track and train condition monitoring, train control, signalling, rail metallurgy, and vehicle power and energy management. It also offers an MSc programme in Railway Systems Engineering and Integration, and provides high level CPD programmes for the railway industry.

The new MRes in Railway Systems Integration is an exciting new programme that combines technical study with training in research methodology and a major research project. The aims of the programme are:
to develop students' understanding of the specific requirements of the complex technologies and concepts that are applied in the context of the railway industry;

- to develop students' research skills and their knowledge of research methods applicable to the specific issues arising in railway related research;
- to ensure that students are aware of state of the art developments in railway research in specific technical and operational topic areas;
- to allow students to develop the understanding necessary to identify new and emerging research needs in today's railway industry;
- to enable students to develop the knowledge and skills required to undertake independently a significant research project of relevance to the railway industry.



Related research

- [Civil Engineering research \(/research/activity/civil-engineering/index.aspx\)](/research/activity/civil-engineering/index.aspx)
- [Birmingham Centre for Railway Research and Education \(/research/activity/railway/index.aspx\)](/research/activity/railway/index.aspx)

Related staff

[Professor Felix Schmid \(/staff/profiles/civil/schmid-felix.aspx\)](/staff/profiles/civil/schmid-felix.aspx)

Employability

It is envisaged that graduates from the programme will be able to follow a number of career paths:

- Doctoral studies in railway engineering, systems integration or in similar interdisciplinary fields;
- Employment as research staff on railway systems engineering related projects, either within railway businesses or within organisations supplying the railway industry;
- Management of high level technological developments in railway companies and administrations;
- Strategic development of policy and technology in railway companies and administrations in the UK and overseas.

University Careers Network

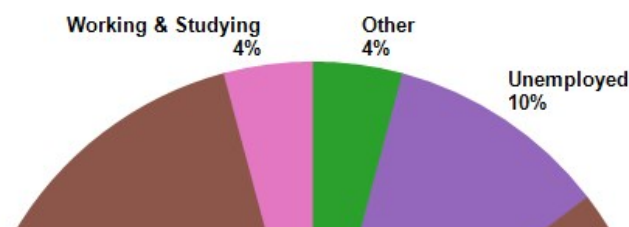
Preparation for your career should be one of the first things you think about as you start university. Whether you have a clear idea of where your future aspirations lie or want to consider the broad range of opportunities available once you have a Birmingham degree, our Careers Network can help you achieve your goal.

Our unique careers guidance service is tailored to your academic subject area, offering a specialised team (in each of the five academic colleges) who can give you expert advice. Our team source exclusive work experience opportunities to help you stand out amongst the competition, with mentoring, global internships and placements available to you. Once you have a career in your sights, one-to-one support with CVs and job applications will help give you the edge.

If you make the most of the **wide range of services** (<https://intranet.birmingham.ac.uk/as/employability/careers/college/eps/index.aspx>) you will be able to develop your career from the moment you arrive.

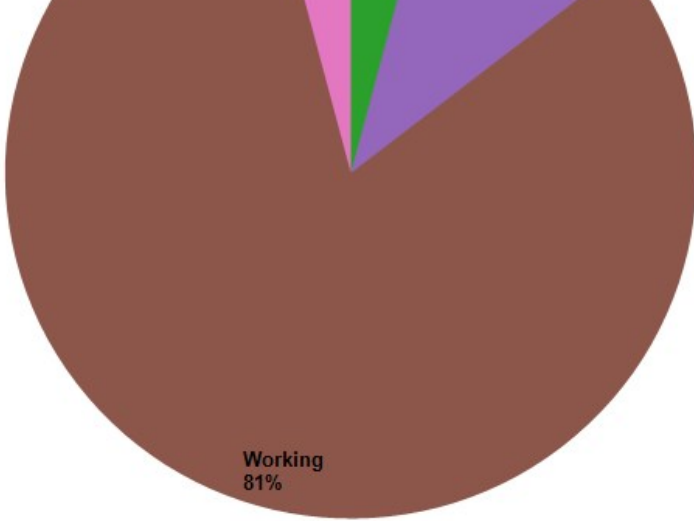
Destinations of Leavers from Higher Education (DLHE) 2011/12 (postgraduate taught graduates)

The DLHE survey is conducted 6 months after graduation.



Examples of employers

- AECOM
- Amey
- Arup
- Atkins
- British Army
- Hyder Consulting



- Interserve
- Laing O'Rourke
- Mouchel
- Network Rail

Examples of occupations

- Assistant Civil Engineer
- Consultant Engineer
- Graduate Bridge Engineer
- Graduate Leader
- Graduate Site Engineer
- Graduate Tunnelling Engineer
- Officer Cadet
- Site Engineer
- Structural Engineer
- Water Engineer

Further study - examples of courses

- MRes Materials and Sustainable Technology

- MRes Science and Engineering of Materials
- MSc Computer Science
- MSc Construction Management
- MSc Environmental Technology
- MSc Railway Systems Engineering and Integration
- MSc Road Engineering and Management
- PhD Civil Engineering

Visit the **Careers section of the University website** (<https://intranet.birmingham.ac.uk/as/employability/careers/college/eps.aspx>) for further information.

