

Hydrogen, Fuel Cells and their Applications MRes

Postgraduate combined research and teaching degree programme Hydrogen, Fuel Cells and their Applications MRes:

This programme falls within the theme Sustainable Power Generation and Supply of the Research Councils' Energy Programme, the first of its kind in the UK. It provides a systematic knowledge and understanding of hydrogen, fuel cells and their applications, including developments and problems at the forefront of the discipline.

Chemical Engineering is dynamic and evolving. It provides many solutions to problems facing industries in the pharmaceutical, biotechnological, oil, energy and food and drink sectors. It is vital to many issues affecting our quality of life; such as better and more economical processes to reduce the environmental burden, and more delicious and longer lasting food due to the right combination of chemistry, ingredients and processing.

Birmingham is a friendly, self-confident, School which has one of the largest concentrations of chemical engineering expertise in the UK. The School is consistently in the top five chemical engineering schools for research in the country.

It has a first-class reputation in learning, teaching and research, and is highly placed in both *The Guardian* and *The Times* league tables. The School was recently awarded the **Queen's Anniversary Prize for Higher Education**.



[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, part time

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

Start date: Flexible

Related courses

[Hydrogen, Fuel Cells and their Applications PhD with Integrated Study \(/postgraduate/courses/combined/chemical-engineering/hydrogen-fuel-cells-integrated-phd.aspx\)](#)

[Postgraduate degree courses - School of Chemical Engineering \(/schools/chemical-engineering/postgraduate/index.aspx\)](#)

Contact

The Centre for Hydrogen and Fuel Cell Research

Email: hfc@contacts.bham.ac.uk (<mailto:hfc@contacts.bham.ac.uk>)

[School of Chemical Engineering \(/schools/chemical-engineering/index.aspx\)](#)

[Follow us on Twitter \(http://twitter.com/eps_unibham\)](http://twitter.com/eps_unibham)

Details

This programme falls within the theme 'Sustainable Power Generation and Supply' of the Research Councils' Energy Programme, the first of its kind in the UK.

Masters graduates will have a systematic knowledge and understanding of hydrogen, fuel cells and their applications, including developments and problems at the forefront of the discipline. They will be able to evaluate current research critically, and be original in the application of their knowledge, proposing new hypotheses as appropriate.

Typical Masters graduates will be able to deal with complex issues, making sound judgements in the absence of complete information, and will be able to communicate their conclusions clearly to specialist and non-specialist audiences. They will be self-motivating and able to act autonomously, and will have the qualities and transferable skills necessary to exercise initiative and personal responsibility, to make decisions in complex and unpredictable situations, and to have the independent learning ability required for continuing professional development.

Their high level of numeracy and skills in problem solving, team working, communication and information technology will equip them for successful careers outside as well as within the process and allied industries.

The MRes in Hydrogen, Fuel Cells and their Applications:

- Demonstrates the exciting future promise of hydrogen, fuel cells and their applications in a zero-emission world
- Shows that industry supports the developments and that jobs are plentiful
- Stresses the international nature of the course, with travel overseas
- Emphasises the high quality nature of the teaching in top grade RAE Schools
- Supports entrepreneurial spirit, with three spin-out companies in hydrogen and fuel cells founded during the past 12 months at the University of Birmingham

Programme content

The programme will focus on taught modules (60 credits) in science, engineering and team building, as well as business and management, and a dissertation.

Further core modules deal with topics such as:

- Materials for Hydrogen and Fuel Cell Technologies
- The Energy System
- Marketing and TQM
- Effective Project Management
- Business Methods, Economics and Strategy

Optional modules

A wide range of optional modules enables you to gain specific knowledge relating to hydrogen energy and fuel cell technology. You may also choose to study business, management and public engagement modules, or develop mathematical modelling skills.

The programme can be studied full-time over one year, or part-time over two or three years. Modules are also available individually to fulfil continuing professional development needs.

Dissertation

The research thesis will focus on any of the following areas: Solid Oxide Fuel Cell Systems, Solid Oxide Fuel Cell Stack Engineering for Domestic Applications, Hydrogen Proton Exchange Membrane Fuel Cell (PEMFC) Stack Engineering for Automotive, Hybrid Vehicular Systems, Membrane Electrode Assembly (MEA) & Electrocatalyst development, Direct Methanol Fuel Cell (DMFC) Stack Engineering for Portable Applications, Alkaline Polymer Electrolyte Fuel Cells, Discovery of New Nano-Materials for Hydrogen Production & Storage, Discovery of non-PGM alloys Materials, Hydrogen Production from Biomolecules by Novel Methods, Development of Novel Pd Alloy Thin-films for Use in High temperature Hydrogen Membrane Reactors.

Successful Masters students will have the opportunity to study for the [PhD with Integrated Study in Hydrogen, Fuel Cells and their Applications](http://postgraduate/courses/combined/chemical-engineering/hydrogen-fuel-cells-integrated-phd.aspx) ([/postgraduate/courses/combined/chemical-engineering/hydrogen-fuel-cells-integrated-phd.aspx](http://postgraduate/courses/combined/chemical-engineering/hydrogen-fuel-cells-integrated-phd.aspx)).

Related links

- [The Centre for Hydrogen and Fuel Cell Research \(/research/activity/chemical-engineering/energy-chemical/fuel-cells/index.aspx\)](http://research/activity/chemical-engineering/energy-chemical/fuel-cells/index.aspx)
- [Hydrogen, Fuel Cells and their Applications PhD with Integrated Study \(/postgraduate/courses/combined/chemical-engineering/hydrogen-fuel-cells-integrated-phd.aspx\)](http://postgraduate/courses/combined/chemical-engineering/hydrogen-fuel-cells-integrated-phd.aspx)
- [Postgraduate degree courses - School of Chemical Engineering \(/schools/chemical-engineering/postgraduate/index.aspx\)](http://schools/chemical-engineering/postgraduate/index.aspx)
- [The Centre for Hydrogen and Fuel Cell Research \(/research/activity/chemical-engineering/energy-chemical/fuel-cells/index.aspx\)](http://research/activity/chemical-engineering/energy-chemical/fuel-cells/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.

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

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

Scholarships and studentships

Scholarships may be available. International students can often gain funding through overseas research scholarships, Commonwealth scholarships or their home government.

Entry requirements

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

International students

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

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

How to apply

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

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>)

[Apply now \(https://pga.bham.ac.uk/lpages/EPSo62.htm\)](https://pga.bham.ac.uk/lpages/EPSo62.htm)

[Apply now \(https://pga.bham.ac.uk/lpages/EPSo62.htm\)](https://pga.bham.ac.uk/lpages/EPSo62.htm)

Related links

[Hydrogen, Fuel Cells and their Applications PhD with Integrated Study \(/postgraduate/courses/combined/chemical-engineering/hydrogen-fuel-cells-integrated-phd.aspx\)](#)

[Postgraduate degree courses - School of Chemical Engineering \(/schools/chemical-engineering/postgraduate/index.aspx\)](#)

Related news and events

[University of Birmingham wins Queen's Anniversary Prize for Higher Education \(/news/latest/2011/11/queens-prize.aspx\)](#)

Learning and teaching

The programme will focus on taught modules (60 credits) in science, engineering and team building, as well as business and management, and a dissertation.

Related research

- [The Centre for Formulation Engineering \(/research/activity/chemical-engineering/index.aspx\)](#)
- [The Centre for Hydrogen and Fuel Cell Research \(/research/activity/chemical-engineering/energy-chemical/fuel-cells/index.aspx\)](#)

Employability

University Careers Network

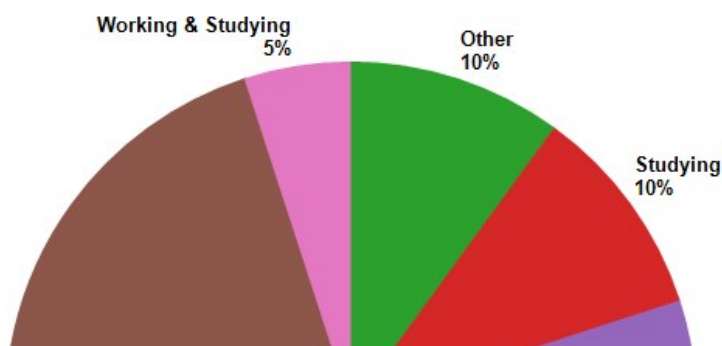
Preparation for your career should be one of the first things you think about as you start university. Whether you have a clear idea of where your future aspirations lie or want to consider the broad range of opportunities available once you have a Birmingham degree, our Careers Network can help you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

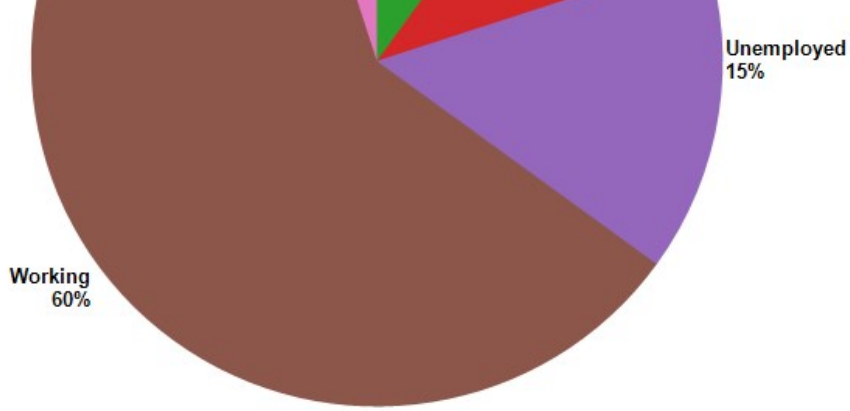
Destinations of Leavers from Higher Education (DLHE) 2011/12 (postgraduate taught graduates)

The DLHE survey is conducted 6 months after graduation.



Examples of employers:

- BP
- British Gypsum
- Citi
- Coca-Cola
- Foster Wheeler Energy
- Jacobs Engineering
- Johnson Matthey
- KBR
- Pepsico



- RBC Capital Markets

Examples of occupations:

- Chemical Engineer
- Development Engineer
- Finance Analyst
- Market Analyst
- Performance Engineer
- Process Engineer
- Process Development Technologist
- Process Support Engineer
- Team Leader
- Test and Validation Engineer

Further study - examples of courses:

- MRes Chemical Engineering Science

- MSc Advanced Chemical Engineering
- MSc Biochemical Engineering
- MSc Chemical Engineering
- PhD Chemical Engineering
- PhD Formulation Engineering
- PhD Regenerative Medicine
- PGCE Mathematics

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

