

# MEng/BEng programmes including Energy Engineering

Chemical and Energy Engineering, Civil and Energy Engineering  
Electrical and Energy Engineering, Materials Science and Energy Engineering



The much vaunted Stern Review showed that investing to reduce climate change is well worth while and if we accept the challenge now we may combat its worst effects. Less well-known is that in the next few years, we must start to make the biggest investments in energy infrastructure seen for a generation, or else suffer frequent power cuts.

*Professor Richard Green, Director of the Institute of Energy Research and Policy.*

It is clear that there is an immediate need for engineering graduates with expertise in energy to help the industry to move towards the most appropriate energy mix of established and new technologies.

Would you like to help meet the challenge and help to change the culture of energy waste? This suite of new research-led degree programmes is our response to meeting this need.

Take a moment to imagine what would happen if the electricity supply to a major city failed completely for several hours or even days and you will realise how much we rely on a steady

supply of electrical energy for almost everything we do. But over the next few decades demand will outstrip supply such that there may be an energy gap of up to 25GW in the UK, which has to be plugged if such power cuts are not to be the norm.

Given that current demand averages 40GW this is a major concern. And it's not just electricity. Addressing our over-reliance on unsustainable fuels for transportation and gas for domestic heating is an even bigger challenge.

Energy modules		
Year	Module title	Credits
1	Introduction to Energy Engineering	20
2	Efficient Heat Engines and Heat Pumps	10
	Electrical Power	10
	Sustainable Development	20
3	Renewable Energy	10
	Advanced Conventional Energy	10
	Environmental Risk Assessment	10
	Energy Economics	10
	Multidisciplinary Energy Project	30 to 60
4	Energy Policy and Case Studies	20
	Sustainable Construction	20
	Individual Energy Project	30 to 60

## Energy content

Each of the four programmes combines in-depth study of your chosen discipline (Chemical, Civil, Electrical or Materials Science) with the energy modules shown in the table overleaf to make up 120 credits each year (for details see [www.eng.bham.ac.uk](http://www.eng.bham.ac.uk)).

The energy modules provide a breadth of coverage of the electrical, civil, economic, sustainable and mechanical issues surrounding energy provision with opportunities in project work to study a specific area in considerable depth. Within each of the separate disciplines there are also embedded elements that complement the energy modules.

In first year you study the 100-credit core of your chosen discipline together with a 20-credit module introducing the breadth of the energy programme. This provides the flexibility to allow you to confirm your decision about your degree choice at the end of first year.

In second year you study the technical and practical challenges of maintaining a national grid, and apply the fundamental thermodynamic principles that underpin traditional and innovative power generation devices. Carbon footprint calculations are studied alongside novel fuel cell technologies and materials recycling.

Third and fourth year involve a range of modules set in an industry context. Government and EU policies continue to impact on domestic and industrial buildings, nuclear power remains a hot topic and economics underpins most developments. The risk assessment module deals with key skills that employers need as well as applications to environmental impacts of energy provision. Case studies are provided by practising energy professionals and the technical details affecting efficiency of a range of energy devices are studied.

## Multi-disciplinary and individual project work

A key feature of MEng engineering degrees at Birmingham is the opportunity to work on a major design project in a multidisciplinary team. Students from all four disciplines are arranged in mixed-discipline teams to complete the design of a major energy facility, for example a major paper manufacturer wishes to change their energy generation capability or a coal-fired power station wishes to extend using new carbon capture technology. Links with major



**'I believe your proposals will make a useful contribution to equipping engineers with the knowledge and understanding to take part in the energy industries.'**

*Director of Engineering,  
RWE npower*

energy suppliers such as npower, E.ON UK and Centrica provide a different real project each year.

In your final year (BEng or MEng) you will complete a major individual study on an energy-related topic of your choice. You are encouraged to identify a real need and some of the best projects involve working with an industrial partner.

## Case-studies and teamwork

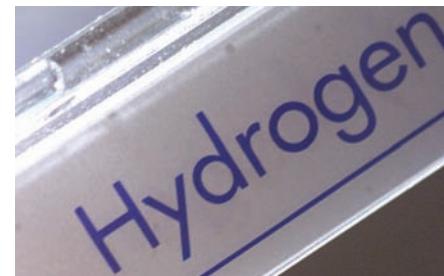
A particular strength of the energy modules is the use of Case Study teaching (see [www.cases.bham.ac.uk](http://www.cases.bham.ac.uk)). Students enjoy this approach and often go much further in their learning as a result.

Employers are particularly interested in students who know how to perform effectively in a team. This is especially relevant given the multidisciplinary nature of energy provision. Opportunities exist in every year to develop such skills.

A particular feature of the programme is the opportunities taken to use national competitions to support learning. For example we have had three teams in the npower challenge finals so far.

## Admissions requirements

For detailed information about admission to one of the programmes contact the Admissions Tutor in your main discipline (see [www.eng.bham.ac.uk/depts.shtml](http://www.eng.bham.ac.uk/depts.shtml)).



## Normal entry requirement are:

The admissions requirements are administered by the Admissions Tutor in your main discipline. Please contact as appropriate:

### School of Chemical Engineering:

ug-admis-chem-eng@bham.ac.uk

### School of Civil Engineering:

uga-civeng@bham.ac.uk

### School of Electronic, Electrical and Computer Engineering:

uga-eece@bham.ac.uk

### School of Metallurgy and Materials:

met-admissions@bham.ac.uk

For further general information about the energy engineering theme see 'Learn more' below.

## Accreditation

The Energy Institute has indicated its approval and accreditation has been sought from the individual engineering professional bodies. This dual-accreditation will allow a choice of career paths on graduation.

## Learn more

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**[www.eng.bham.ac.uk/energy](http://www.eng.bham.ac.uk/energy)**

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 dropped and new ones offered in their place.

Power Station Image credited to Liz Bryan Graphics