OUR PROGRAMMES

Single Honours
MEng Nuclear Engineering  
BSc Nuclear Science and Materials

UCAS CODE

H822
H821
One of the major challenges the UK faces is the reshaping of how electricity is generated, with the shifts away from fossil fuels toward low-carbon sources. The government is investing in the construction of a suite of new nuclear power stations to deliver 20–40% of the UK’s electricity, both to replace retiring plants and for increased capacity. The UK also has to manage the retiring of its current nuclear power plants and dealing with its nuclear waste. As a nuclear engineer, you will have ample opportunities to take a leading role in the energy future of the UK.

WHY STUDY NUCLEAR ENGINEERING WITH US?

- Exciting new programme structure, building on our experience of teaching nuclear engineering courses for over 60 years
- The course is taught jointly by the School of Metallurgy and Materials and the School of Physics and Astronomy, both amongst the highest-ranked for their disciplines in the country
- Research-led teaching, embedded within one of the best centres for materials science and engineering research in the country
- Opportunities to do paid placements both within our research groups and at our industrial partners
- Accredited by IOM, which gives our students a clear pathway to become Chartered Engineers
- A range of state-of-the-art facilities, including a £40 million collaborative teaching laboratory and a £55 million sports centre that provides some unique facilities, such as a 50m swimming pool
- The University is based within a campus only eight minutes away from the city centre by train

ACADEMIC PROFILE

Professor Alison Davenport OBE
Head of School

Our unique programmes were designed in response to demand from industry for graduates equipped with the fundamental knowledge to build the nuclear power plants needed for our future energy requirements. This challenging and growing field offers a range of well-paid careers for graduates with strong technical and scientific skills. The University has over 60 years of experience in this sector and hosts the multidisciplinary Birmingham Centre for Nuclear Education and Research. We also have strong links with the nuclear industry who recruit extensively from our educational programmes.

The present course combines modules in Physics, Mathematics and Computing together with Materials Science and Engineering, so that you develop both engineering skills alongside fundamental principles. By the end of the course, you will have a broad grasp of physics and engineering principles together with a detailed understanding of nuclear reactor physics, materials, nuclear science and radiation.
WHERE COULD YOUR DEGREE TAKE YOU?

As a Nuclear Engineering graduate, the skills you develop at the University of Birmingham will allow you to seek employment across a variety of sectors, although the majority of our graduates join the energy sector as engineers. Other possible career pathways include working in the financial sector, defence sector, or opting to do a PhD to access research and development roles or academia.

Our graduates can be found in roles as diverse as:
- Graduate engineer
- Technical representative
- Health physicist
- Nuclear consultant
- Nuclear safety engineer
- Design engineer

Our graduates have gone on to work for well-known employers such as:
- Rolls-Royce
- EDF
- Babcock
- Sellafield
- Atkins
- Science and Technology Facilities Council

ANGUS
MEng graduate

‘As a student of Nuclear Engineering, the multidisciplinary nature of the course enabled me to develop an understanding of the fundamental principles behind several fields of engineering, as well as those from a conventional Physics degree. The practical skills that I learned from project work and laboratory sessions, have given me the confidence and experience required to undertake independent research. In a relatively small class, I found myself a member of a group of people who were uniquely supportive of one another throughout this time, and have made friends that I have taken with me as I move into the next chapter of my life.’
PATHWAYS

You can benefit from flexibility to tailor your degree to match your strengths, interests and aspirations. You can make these choices during the second year. The ability to tailor your degree will make your unique profile stand out in the eyes of future employers and recruiters.

BSc or MEng
We run both a three-year BSc and a four-year MEng. You can make your choice at the end of your second year. In order to stay or switch to the four-year MEng programme, you must achieve an average of 55% or above at the end of the second year.

Year in Industry
Between Years 2 and 3, you can opt to take a full year working in industry, giving you the opportunity to experience work before you graduate. This boosts your confidence, helps you develop a range of workplace skills, and makes your profile unique for future employers.

Year Abroad
Students taking this pathway can travel to another country after Year 2, and spend a year at a partner foreign university. This gives you an opportunity to perfect another language, and embed yourself in a new culture. Spending a year abroad may also allow you to complement the curriculum covered at Birmingham with different specialist topics.

Year in Computer Science
We offer an innovative one-year programme called ‘Intercalated Year in Computer Science’ which fits between Years 2 and 3. During this intercalated year, you spend a year in the School of Computer Science, gaining in-depth knowledge of computing, including advanced topics such as artificial intelligence and machine learning.

MODULES

Our Nuclear Engineering programmes combine fundamental physics with some materials science and engineering and engineering concepts. This is to ensure you have the skills to tackle current and future challenges faced by the nuclear industry. After the first two years focusing on more theoretical and fundamental content, you will apply your knowledge to real-world situations such as radiation detection, radiation protection, and reactor design.

Your modules in the first year will be:
- Electromagnetism, Temperature and Matter
- Classical Mechanics, Relativity and Quantum Mechanics
- Physics Laboratory
- Fundamentals of Materials Science
- Design for Structural Applications
- Mathematics

JASDEEP
MEng graduate

’The nuclear courses at the University of Birmingham are well renowned in industry. When it comes to looking for a job, you will have gained an advanced skillset, which sets you apart from the masses. What’s more, Birmingham offers unique opportunities because of its many high-profile industry connections. Myself and a select few were funded to attend a clean energy summer school in China! I loved the experience so much, after graduating with a First in MEng Nuclear Engineering I spent a year teaching in China, after which I relocated to Bristol to start work as a Nuclear Consultant at Mott MacDonald – an engineering consultancy.’
**ENTRY REQUIREMENTS**

The qualifications you need to achieve a place on one of our degree programmes can be found on our website. We accept A levels, the International Baccalaureate Diploma, and a range of other equivalent qualifications. Our offers are tailored to your academic profile. For specific information on entry requirements please contact us.

**Required subjects**
We require A levels or equivalent qualifications in Maths and Physics. This ensures you will have the required background to succeed on our programmes.

**Extended Project Qualification (EPQ)**
We do not require students to take an EPQ to study with us. However, for students who are taking an EPQ, we can reduce your offer by one grade if you achieve at least an A grade in this qualification.

**Foundation Year**
If you happen not to have the required qualifications, please contact us. We offer a foundation year which covers the background knowledge you will need to succeed on our programmes. Students that join our foundation year spend a year covering mathematics, physics and chemistry, as well as essential studying and communication skills. At the end of the year, provided you satisfy our entry criteria, you will be able to progress to the first year of our programmes.

Visit [www.birmingham.ac.uk/nuclear](http://www.birmingham.ac.uk/nuclear) for details

**SOCIETY**

The Nuclear Society, or NucSoc, is the student society that looks after Nuclear Engineering students at the University of Birmingham. It is led by a committee of elected students, and aims to provide enjoyable social and professional support to all of our students. This includes game nights, film nights, house parties, as well as guest lectures, careers events and visits to industrial partners. They also organise charity events and help run outreach activities. NucSoc career fairs have been particularly successful. The society has managed to attract a diverse range of employers to campus, leading to a full day of engaging talks and fair activities. We look forward to you getting involved in its activities and committee.
When you join our programmes, you will be assigned a personal tutor. Your personal tutor is an academic member of staff whose role it is to provide academic support throughout your studies. Your personal tutor will also be able to advise you should you require any additional support whilst studying, including supporting any wellbeing issues, and will be an important contact when you begin considering future careers or further study. You will meet your personal tutor on a weekly basis in a small group (maximum four students) or one-on-one.

Our professional wellbeing officers are available to help you throughout your time at the University. They are able to advise on anything you might be struggling with and get you the support you need to succeed. If you have a disability, they will work with you to determine what adjustment will need to be made to your teaching and learning in order to ensure you achieve your goals. If you become ill, they are able to arrange for your deadlines to be extended, or for your illness to be taken into account when monitoring your progress.

At the start of the academic year, a large variety of accessible and friendly events will take place to ensure you settle well at the University, and form strong long-lasting relationships with staff and peers.
RESEARCH

By choosing to study Nuclear Engineering at Birmingham, you are choosing to join an institution with a strong international research profile, and world-leading research groups in many key areas such as life extension, waste management, nuclear physics and robotics in extreme environments. The University of Birmingham will also house the only high-flux accelerator-driven neutron irradiation facility in the UK, making the University a world-leading centre for the study of the interaction between neutrons and anything that may be affected by them such as materials, components and live tissue.

As a research-intensive Russell Group university, our staff have a passion for achieving significant advances in the nuclear sector, and sharing their knowledge and discoveries with students. You will also experience cutting-edge research during your group and individual projects.

ROB

MEng graduate

‘Since graduating with an MEng in Nuclear Engineering, I have continued at Birmingham towards a PhD! Shifting slightly away from, but still keeping my love for nuclear science, I now look at electron interactions in magnetic systems. Finding a lot of translatable skills from the Nuclear Engineering course, I have been able to expand on those skills in a different area, while also being able to maintain my skillset with lab demonstrating and teaching responsibilities as a postgraduate. For me, one of the highlights of my undergraduate degree was the amount of lab time over the four years, as well as the experience of processing experimental results into real physical understanding – as someone who is now an experimentalist, this foundation knowledge has been incredibly important. Other highlights include the constant interaction with academics, helping to build a genuine understanding of the subject material and appreciation for the complexity of the problems faced in the nuclear industry.’
The interdisciplinary Centre for Nuclear Education and Research has strong links with industry, collaborating with companies and consulting on issues ranging from fundamental physics to applying robotic solutions to problematic tasks and the consideration of human factors. Besides our undergraduate and postgraduate courses, we also provide continuing professional development opportunities for employees in the nuclear sector. Some of our industrial partners include:

- EDF
- Rolls-Royce
- Horizon Npower
- BAE Systems
- AWE
- National Nuclear Laboratory
- UK Atomic Energy Authority
- UK Nuclear Decommissioning Authority

Our Industrial Advisory Board meets regularly and comments on our activities to help us formulate a strategy that ensures our graduates are well-equipped to succeed in their engaging and rewarding careers.

**EMILY**

MEng graduate

‘I work for the Science and Technology Facilities Council, the UK government agency for science and engineering research. I am a graduate in the Scientific Computing department where I use simulation codes to model the behaviour of experimental reactors and develop software tools for the use of instrument scientists. In practice, most of my time is spent programming and building computational models. I found the Nuclear Engineering course varied in subject matter and I am able to leverage many of the different skills I learnt from university at work. It gave me a broad set of experiences to draw on and so I also had a flexible choice of industries during the job application process.’

**JONATHAN**

MEng graduate

‘I am in my second year as a Graduate Health Physicist working for a global engineering firm. My degree has given me all of the skills I need to shape my career as a Health Physicist in the nuclear industry; in particular, the focus on radiation protection and nuclear safety has been invaluable for my professional development. The nuclear engineering course has strong links with the nuclear industry, and I especially loved the range of relevant modules and the exciting range of projects that were available to me.’
NEAL
MEng graduate

‘All lectures are thoroughly engaging, well planned and taught by staff who are leading experts in their fields with excellent subject pedagogy, and who are more than happy to give up their free time to explain ideas and concepts where you may need further support. Whilst studying, I have also been given the opportunity to complete summer internships in additive manufacturing and material characterisation. At the end of my third year, I was given the prestigious opportunity to travel to China for the Xiamen Clean Energy Science and Technology Summer School. There is no better university or department to do this at than the University of Birmingham. I cannot recommend it more highly.’

APPLICATION TIPS

We will make offers to individuals who are enthusiastic and motivated, and who have the ability to succeed here. Information we consider carefully includes the prior qualifications you have such as your GCSE grades, your personal statement, the academic reference, and the qualifications you are currently working towards, along with any predicted grades. Your personal statement is your opportunity to explain why you are interested in nuclear engineering, and the events, readings and interests that shaped and sparked your interest for the subject. You do not necessarily have to have work experience, although this can help you to explain how your interests have developed over time.

CONTACT US

General admissions enquiries:
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FIND OUT MORE ABOUT NUCLEAR SCIENCE AND ENGINEERING AT BIRMINGHAM NOW: WWW.BIRMINGHAM.AC.UK/NUCLEAR
This leaflet was produced 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. Before you apply, please visit our website to view essential information for all applicants: www.birmingham.ac.uk/applicantinformation

Please note the information in this brochure is correct at time of publication but may be subject to change (July 2020).