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New materials underpin development and progress across a wide variety of sectors. New technologies, from planes to batteries, from hip implants to electronic devices, are made possible, and often limited by, the materials we currently know and use. Materials scientists and engineers work hard to understand how and why materials behave the way they do, and exploit this knowledge to develop new materials with amazing properties. As a materials scientist and engineer, you will have ample opportunities to be at the leading edge of a field that is undergoing continuous developments and studying this subject at the University of Birmingham will pave the way to a successful and exciting career.

WHY STUDY MATERIALS SCIENCE AND ENGINEERING AT BIRMINGHAM?

- Exciting new programme structure, building on our experience of teaching Materials Science and Engineering for more than 100 years
- 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
- Flexible programme structure, with optional module choices and opportunities to do intercalated years in industry, abroad, or developing advanced computer science and programming skills
- Accredited by IOM³, 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

‘I am proud to introduce the Materials Science and Engineering programmes we offer in our School. If your mind is already settled on studying Materials Science and Engineering, you have made an excellent choice: demand for well-qualified graduates in this field is increasing, and we see our students proceed on to stimulating and promising careers. If, on the other hand, you are still considering a range of disciplines, I hope this brochure will provide you with some inspiration and encourage you to study this discipline at undergraduate level. This brochure will highlight some of the opportunities you will have as a student in our School. These include entry scholarships, paid summer internships within one of our research groups, placements at partner industrial companies both in the UK and abroad, and the option to continue your studies at postgraduate level, such as via a fully funded PhD degree. Our aim is to recruit highly motivated and passionate students, and develop them to become the next generation of engineers and scientists.’
WHERE COULD YOUR DEGREE TAKE YOU?

As a materials science and engineering graduate, the skills you develop will allow you to seek employment across a variety of sectors. A degree in materials science and engineering unlocks career pathways in materials engineering firms, manufacturing companies, general engineering firms, as well as in the financial sector.

Our graduates can be found in roles as diverse as:
- Graduate engineer
- Materials applications engineer
- Technical representative
- Young graduate trainee
- Materials integrity engineer
- Development engineer

Our graduates have gone on to work for well-known employers such as:
- Rolls-Royce
- National Composites Centre
- AMG Mercedes
- Airbus
- Jaguar Land-Rover
- Nike

BELINDA
MEng Materials Science and Engineering

‘From day one, we study a broad range of materials from the perspectives of consumer, manufacturer, engineer and researcher. We are taught cutting-edge science and how it applies to real-world problems. The lecturers are knowledgeable and enthusiastic about their fields, and happily give up their time to discuss lecture content with students. On top of this, the support provided by the departmental staff is unrivalled. I’m very grateful to this department for all the opportunities it has provided me.’
PATHWAYS

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

Optional modules
Optional modules in Years 3 and 4 give you ample opportunities to specialise in areas that fit your interests and professional goals. Modules can focus on biomaterials, nanomaterials, electronic materials, advanced alloys and more.

Year in Industry
You can opt to take a year to work in industry between Years 2 and 3, to experience work before you graduate. This boosts your confidence, helps you develop workplace skills, and makes your profile unique.

Our students spend their year in industry at Airbus, AMG Mercedes, the European Space Agency and many others.

Year abroad
You can spend a year at a partner foreign university. This gives you an opportunity to perfect a foreign 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’ between Year 2 and Year 3. During this intercalated year, you can gain in-depth knowledge of computing, including advanced topics such as artificial intelligence and machine learning.

MODULES

In Year 1, you will start to link the behaviour and properties of materials to fundamental knowledge of their structure. As you progress to Year 2, you will develop a more complete understanding of how materials may be modified to suit our needs. During Years 3 and 4, you will learn how high-performance materials have been designed to maximise their properties, deepen your knowledge of specialist topics and work on projects to refine your laboratory planning skills.

Your modules in the first year will be:
- Fundamentals of Materials Science
- Design for Structural Applications
- Non-crystalline Materials 1
- Design for Functional Applications 1
- Communication and Critical Reasoning
- Mathematics

SAMUEL

MEng Materials Science and Engineering

‘Since discovering the subject, I have found countless applications in everyday life where materials science has a vital role. The content of the course covers a wide range of sectors and I think it is a perfect blend of science and engineering where complex theory is applied to the real world. The department is always welcoming and supportive, and the small lecture size means you’re always able to ask questions. I really love the community feel that having a campus-based university gives you.’
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.

Subjects
We require A levels or equivalent qualifications in Maths and a physical science such as Physics or Chemistry. This ensures you will have the required background to succeed on our course.

Visit www.birmingham.ac.uk/materials for details

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 do not 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 they satisfy our entry criteria, they will be able to progress to the first year of our programmes.

SOCIETY

The Birmingham University Materials Society is the student society that looks after Materials Science and 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. The society has been so successful that it is the only society to have won the award of best society in the College of Engineering and Physical Sciences twice. We look forward to you getting involved in its activities and committee.
SUPPORT

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.
By choosing to study Materials Science and 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 battery technology, lightweight materials, biomaterials and materials for extreme environments. You will find this becomes increasingly important as you progress through your degree towards the very forefront of materials science and engineering.

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

RICHARD

MEng Graduate

‘The huge range of research, industrial links and highly enthusiastic staff at Birmingham meant that during my undergraduate years I was given the opportunity to complete several research placements ranging from additive manufacturing to remote sensing. Following graduation, I continued my studies at PhD level, investigating the use of Acoustic Emission techniques to remotely monitor and predict component failures. The combination of a small friendly department and cutting-edge research is what drew me to study here, a decision I would definitely make again.’
The School of Metallurgy and Materials at the University of Birmingham has strong links with industry and together we work closely to translate fundamental research into commercial products and services. For example, the School operates the High Temperature Research Centre (HTRC), a £60 million facility sponsored by Rolls-Royce and the UK government. HTRC plays a key role in exploiting our know-how to manufacture advanced components for new and upcoming jet engines.

Our Industrial Advisory Board includes:
- Rolls-Royce
- BAE systems
- UK AEA
- Woods Group

The role of the Industrial Advisory Board is to comment on our activities and help us formulate a strategy that ensures our graduates are well-equipped to succeed in their engaging and rewarding careers.

DEBORAH

MEng graduate

‘I’ve completed three placements as part of my grad scheme at Rolls-Royce. The first was in repair technology, which developed new sustainable technologies for current and future engine programs. I then completed a design and make project to obtain a manoeuvring room simulator for a nuclear submarine for the Royal Navy. Now I’m developing their new hydro-mechanical strategy line.’

LORENZO

MEng graduate

‘During my 12-month placement at Mercedes AMG HPP, I applied theoretical knowledge covered on the course to identify failure mechanisms of F1 power units, proposing solutions to prevent failures on race weekends. I also researched new materials and surface treatments that could boost reliability and performance. On return to University, I started an individual project in one of the School’s strongest areas of expertise: alloy design. I particularly focused on using theoretical models to predict materials’ properties. The variety of modules covered prepared me really well for both professional and academic challenges by constantly stimulating my interest and motivating me to learn.’
EMMA
BEng Materials Science and Engineering

‘My course made me discover a whole range of materials: polymers, metal alloys, composites, ceramics and natural materials. I learned about their properties and about computational modelling, while keeping a very close look at optimising materials for real-world applications. After my Bachelors, I decided to go to EPFL (The Swiss Federal Institute of Technology in Lausanne) to do my Masters. During my Masters, I chose to focus on materials for energy conversion and renewable energy. I am currently on a placement in a company in Denmark, working on sustainable paints to apply on wind turbine blades.’

APPLICATION TIPS

We will make offers to individuals who are enthusiastic and motivated students, and who have the ability to succeed here. Information we consider carefully includes your 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 materials science and engineering, and the events, readings and interests that shaped and sparked your interest in 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. We interview the vast majority of our applicants. The interview is a way for us to explore your interest and passion for the subject, and a great way for you to get to know us and our academics better.

CONTACT US

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Materials Science and Engineering
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FIND OUT MORE ABOUT MATERIALS SCIENCE AND ENGINEERING AT BIRMINGHAM NOW: WWW.BIRMINGHAM.AC.UK/MATERIALS
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 discontinued and new ones offered in their place.

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