



The
University
Of
Sheffield.

Department
Of
Materials Science &
Engineering.

Materials Science & Engineering.

Undergraduate Courses.

Materials Science & Engineering

Automotive



Robotics



Aerospace



Nuclear



Mechanical



Environmental



Electrical



Computer



Civil



Chemical



Bioengineering



Materials change the world



Take a look around you. Materials are everywhere. Used for different applications, for different reasons. Without materials scientists and engineers, aeroplanes wouldn't fly, buildings wouldn't stand up, mobile phones wouldn't work, healthcare wouldn't be the same.



Materials Science and Engineering is a subject that is integral to all other engineering disciplines. It brings together physics, chemistry, engineering, maths, and in some cases, biology, and puts these subjects into real-life situations.



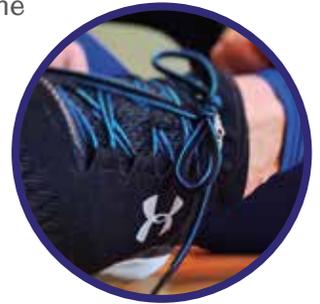
When you study Materials Science and Engineering, you will learn the underpinning physics and chemistry of materials and how these give rise to certain properties, like toughness or durability.



You learn how different processing techniques, such as additive layer manufacturing, influence these properties and how that affects the functions of materials in engineering applications. You understand materials from the atomic scale upwards and recognise how small changes in their composition and/or structures can have big effects on their properties. With this knowledge, you will be able to help design and manufacture the next generation of new sustainable materials for applications such as renewable energy generation.



We'll challenge you to think about engineering issues from a global perspective. So wherever your future lies, you'll be in demand.





iForge is a student-led makerspace located in The Diamond. It is an area facilitating collaboration, innovation and the creation or prototyping of anything students wish to make. The iForge is run by students for students and is a 24/7 facility. Housing a wide range of equipment, from traditional hand tools and a sewing machine to state-of-the-art laser cutters and 3D printers, the possibilities for what can be made in the iForge are limitless. So far hundreds of students have produced a diverse array of products, including battle robots, 3D printed Christmas decorations, parts for tribology research and a fully moving Thomas the Tank Engine cake.



“A lot of the academics have industrial contacts, and they are happy to share these contacts with students, which is how I got my second industrial placement and was subsequently offered a permanent job.”

Katie Atkins

MEng Materials Science and Engineering



Why study at Sheffield?

World-class facilities

Much of your time will be spent in The Diamond, the University's dedicated engineering teaching facility. Here, you'll find lecture theatres, seminar rooms, open plan learning spaces, library services and a number of specialist engineering laboratories. Not only do you get to use the materials lab, packed full of research grade equipment, but because Materials Science and Engineering is integrated into all other types of engineering, our students get to experience working in multiple laboratories in the Diamond, such as the electronics lab and the clean room. There are also social spaces and a cafe where you can take a well-earned break from studying.

Teaching excellence

Our world-class staff will help you to develop as a scientist and engineer. Our academics are leading experts in their fields with international reputations, and their research shapes and inspires what you are taught. Combining this knowledge with industrial understanding means that what we teach you is relevant today and into the future.

Industry contact

Over many years, we have developed close relationships with businesses across a broad range of industry sectors. Therefore, you will have the opportunity to explore opportunities in pretty much any sector that interests you through visits, placements and project work.

If you choose one of our MEng courses, in your third and fourth years you participate in our Industrial Training Programmes - three real-life projects defined by industry partners giving you an insight into how businesses approach engineering problem solving. Students selecting the research route undertake research projects instead of the Industrial Training programme.

Support

Your welfare and development is a priority for us. You will be allocated a personal tutor who you can talk to about any issues you have or support you may need, or you can talk to any member of staff and they will endeavour to help you. Similarly, if you have concerns about any other student or staff member, these will be handled discreetly and in confidence.

Community

We welcome students from all over the world, so you will be studying with people from other countries and cultures. You will also be taught by world-leading academics from around the globe.

We encourage a sense of community between our courses, year groups, staff and students, with our annual ball being a highlight of the year.





“The best part of the course is how diverse it is; you can go into aerospace, automotive, biomed, nuclear, ceramics and tailor the options to your interests. The opportunity to undertake a language course and an industrial placement are also very useful to add extra to your CV when it’s time to graduate.”

Niki Kesharaju

MEng Materials Science and Engineering

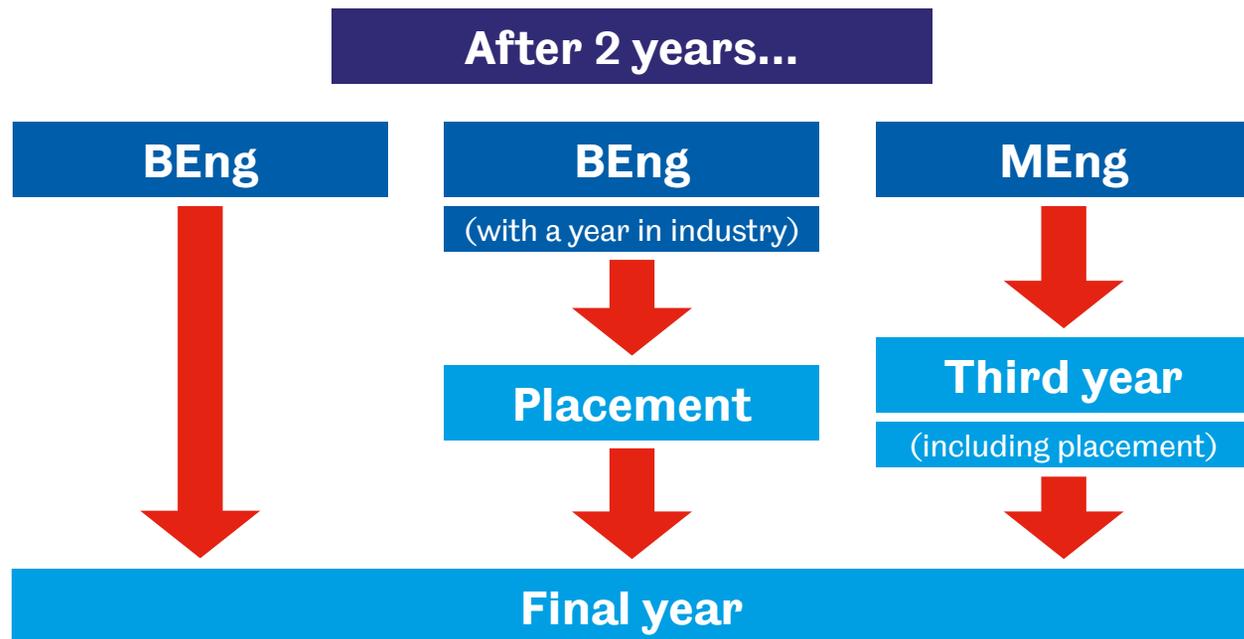
The Right Course for you

Flexibility

The first two years of all our courses are the same, although optional modules allow you to explore different areas of interest. So while you may apply for one course, you have the option to switch to one of our other courses before the end of the second year. This means that you can follow a specialist path, or move to a more general option, depending on what you enjoy most on the course.

The first two years provide you with an underlying understanding of the principles of materials science and how it is applied to engineering situations. With these principles in place, you can then tailor your learning so that it meets your strengths and interests.

Details of our courses can be found on the course inserts - available from a member of our admissions team (0114 222 5467, mse.ugadmissions@sheffield.ac.uk) or found at the back of this booklet.





“Most of our labs take place in The Diamond, which means that we can get our hands on the newest and most advanced tools. The session I like most this year is the sand casting of aluminium. My hands were shaking when I was standing in a huge sand pit and pouring red hot molten aluminium into a sand mould.”

Cheuk Ying Tam

BEng Materials Science and Engineering

Typical first-year academic week

	Monday	Tuesday	Wednesday	Thursday	Friday
9.00-9.50	Diamond Laboratory Practical (Group A)	Mathematics	Digital Skills for Materials		Mechanical Properties of Materials
10.00-10.50		Materials Chemistry		Tutorial	Biomaterials
11.00-11.50		Nanomaterials	Tissue Structure and Function	Mathematics for Chemists	Introduction to Materials Chemistry
12.00-12.50		Personal Tutorial	Nanomaterials	Mathematics (Materials)	Biomaterials
1.00-1.50				Biomaterials Practical	Thermodynamics
2.00-2.50	Diamond Laboratory Practical (Group B)		Engineering Solids		
3.00-3.50		Mechanical Properties of Materials	Materials and the Environment		
4.00-4.50					Thermodynamics
5.00-5.50	Thermodynamics			Mechanical Properties of Materials	

Lecture

Practical

Tutorial

Self-study/free time

What to expect

Starting a degree course can be a daunting prospect. We want to give you a feel for what you can expect in your average week. Throughout the year, you'll experience a variety of learning methods, and there is strong emphasis on self-study, so you have to demonstrate self-discipline. You also have to find time to relax and unwind - your university experience is not just about gaining a degree. Gaining life experience is just as important!

We use real situations to give you a good understanding of practical applications and how you may one day use your knowledge and skills in work.

You'll learn through case studies, design projects, group industrial projects, lab work, and manufacturing and plant visits. Alongside technical expertise, you'll develop invaluable skills in teamwork, logical reasoning, project management and problem solving.

You will have 15-24 hours of staff contact time per week in various forms. The concepts taught to you throughout your lectures are reinforced through smaller groups. You will have a personal academic tutor who will go through key ideas and problems. Experimental practicals run in the Materials laboratory in the Diamond on Mondays. Typically you will have a morning or afternoon session each week. The smaller laboratory groups provides you a greater amount of time using the equipment whilst also allowing us to provide useful feedback at the end of the session to help you improve. Details of the modules are available on the separate course information sheets.

Lectures are recorded and shared on your online learning environment (MOLE), so you can refer back to them at any time to consolidate your learning. However, there is no substitute for actually attending the lectures in person!





We make sure our graduates gain industry-relevant skills. Of our students graduating between 2015 and 2017, on average 96% were in a graduate level job or further study 6 months after graduating.

Experiential Learning

We take a 'learn by doing' approach to our courses. It's not just about sitting in lectures, taking notes. A lot of your time will be spent in labs putting the theory into practice. You'll develop industry relevant skills and use equipment found in industry, so that when you eventually enter your chosen career, you'll be equipped with the know-how to hit the ground running.

We encourage creativity and initiative to learn about the science and engineering of materials, and how to develop new materials and technologies for industry and manufacturing. For example, in your second year you will be part of a research team that takes apart a product, such as a kettle or a razor, in order to understand their material requirements, performance, life cycle and environmental impact. As a team, you present your findings to your lecturers and fellow students.

Industrial training

As well as access to unique specialist laboratory and workshop facilities in The Diamond, the Department has introduced unique ways of bringing Industry into our courses.

In the third and fourth year of the MEng degrees, students take part in three Industrial Training Programmes, each defined by an industry partner, focusing on areas such as:

- nuclear materials
- glass materials
- aerospace materials
- metallic materials
- advanced manufacturing

For each there are small group seminars with industry experts and engineers, academic lectures and visits to industry sites and technology centres, and students apply their materials science and engineering knowledge to analyse and solve a real current industrial materials problem.

Extended industrial placement

Our MEng students get the opportunity to undertake a guaranteed five-month extended industrial placement to help with knowledge and skills development within an employment context. These placements also allow you to build relationships with contacts for future career opportunities.

Previously, our students have taken up placements as far afield as Mexico and New Zealand, and many employers use this time as an extended interview and assessment process before offering the student a permanent job after graduation.

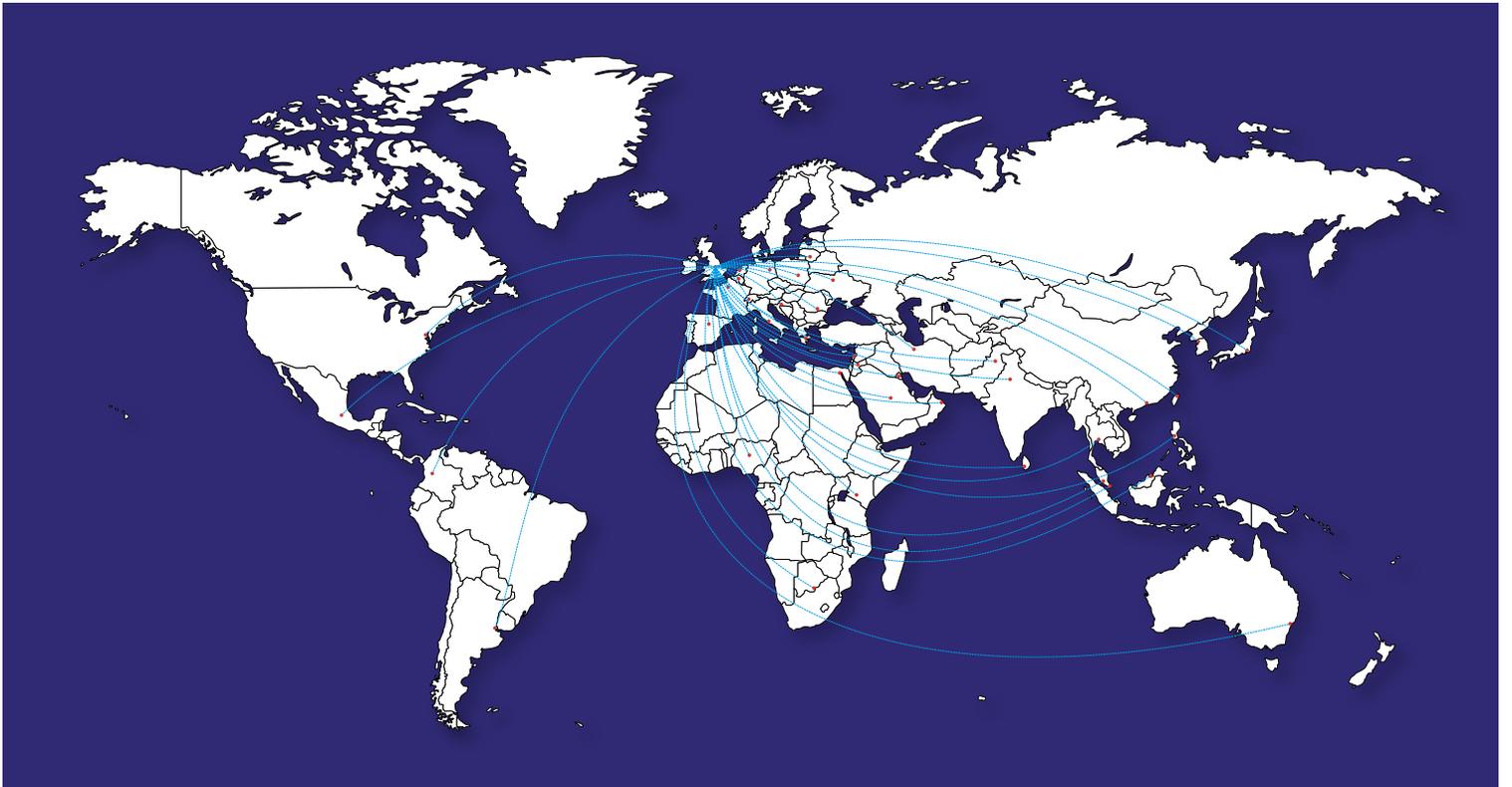
Interdisciplinary projects

Every year, all first year students in the Faculty of Engineering take part in the Global Engineering Challenge - a week-long project where teams of students from different engineering disciplines combine their skills to tackle real-world problems from a global perspective. We'll challenge you to think about not only the technical issues in engineering developments, but also the social, ethical and environmental implications of your decisions.

“I am extremely grateful for the opportunity to take part in a high-value hands-on project. I feel that it has presented me with a large breadth of learning opportunities that would not have been possible in a typical lecture-based learning environment.”

Luke McCarthy

MEng Materials Science and Engineering



Your life in Sheffield

Accommodation

All first year students are guaranteed a place in University accommodation provided you meet a few simple conditions. International students are guaranteed accommodation for the duration of their studies. sheffield.ac.uk/accommodation/guarantee.

Our University accommodation has been repeatedly voted top five in the UK in the Times Higher Education Student Experience Survey, and the majority of our accommodation is in one of the UK's most affluent districts.

You can choose between the vibrant city centre residences or the student village located in the green and leafy suburbs of the city.

Affordable living

Sheffield regularly ranks among the top 10 most affordable UK university cities according to the Student Living Index, with an average cost of living 10% less than the national average. Because of the large student population, shops and services are queuing up to offer discounts. And since the student accommodation is located close to the University, transport costs can be a lot less than in other cities.

“The Department is a friendly inclusive environment where you are challenged to reach your potential. The best part about University is the people you get to meet, wherever they come from they bring their culture and influences.”

Ross McGregor

MEng Materials Science and Engineering

#WeAreInternational

In the Department of Materials Science and Engineering, we are proud of our diversity. Staff, students and alumni come from all walks of life, and we consider ourselves to be fully inclusive.

We attract students and staff from all over the world. Currently you can find people from over 40 countries and 6 continents working together in the department, and we actively encourage interaction between groups.

MatSoc

Run by students for students, the Materials Science and Engineering Society (MatSoc) is fun, friendly and ideal for meeting students from other years as well as joining socials, trips and sporting events.

Events can range from visits to the Peak District to bowling to bar socials – there is something for everyone.

Plus if you're into competitive sport, the Society has two 6-a-side football teams and two netball matches a week, with plenty of other sporting opportunities available throughout the year.

Twitter: @mat_soc

Facebook: matsocuos

“I enjoyed forming a good bond amongst the course group and getting hands-on experience with such a wide range of materials and techniques.”

Gabby Coe

MEng Materials Science and Engineering (Research)



The
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Department
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Materials Science &
Engineering.



#IAmAMaterialsScientist

-  @msesheffield
-  msesheffield
-  mse_sheffield
-  the-department-of-materials-science-and-engineering

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Where next?

A degree in Materials Science and Engineering opens the doors to a vast array of career options. All manufacturing industry sectors need materials scientists and engineers to help them find the right materials for their applications, and develop new ones where they currently don't meet their demands.

You could find yourself in production, design, manufacturing, research and development, patent law or quality control. You might find a non-technical role is more for you, such as sales, procurement or marketing. Or perhaps an academic career is where your future lies: take on a postgraduate qualification, become a teacher or lecturer and become a world-leading expert in your chosen field.

We'll help you open the door; it's up to you to choose which path you take.

“With a degree in Materials Science and Engineering, which covers such a diverse range of topics, I realised that I could work in many different industries and all over the world.”

Adam Urwick

MEng Materials Science and Engineering (Biomaterials)

Our graduates have been employed by companies large and small, across a range of industry sectors and all around the world. The following are just some of the companies where our students have started their working lives.

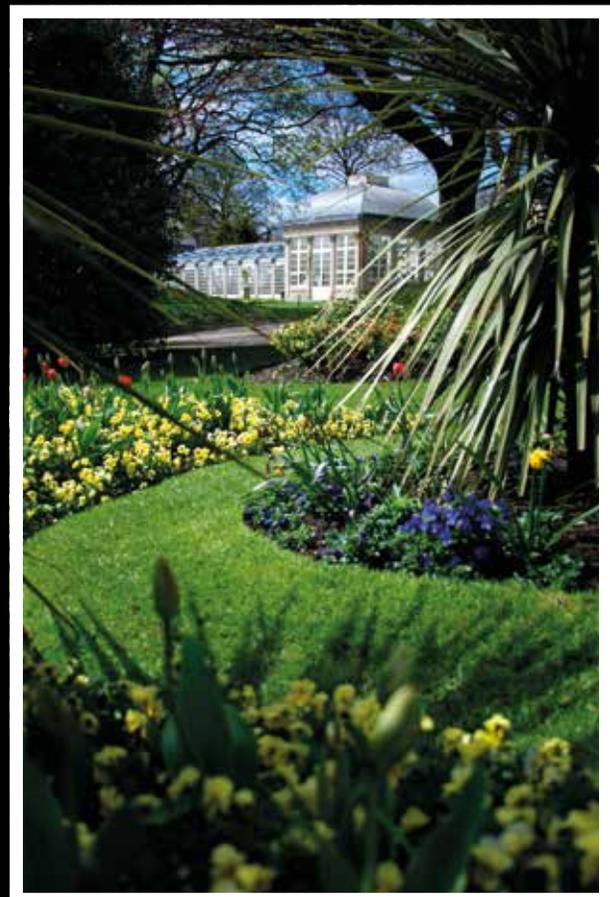




“In addition to Sheffield being a highly regarded engineering university, the thing I like the most is that it’s so close to the Peak District, so I can hop on my bike, cycle for 20 minutes and I’m out of the city and in an open green space where I can do climbing, cycling and all the sports that I like to do.”

James Cockburn

MEng Materials Science and Engineering (Research)



Our city

Known the world over as “The Steel City”, Sheffield was famed for its industry in the heyday of the 1900s and remains a city of innovation to this day. This development has been mirrored by the development of the Department, the origins of which can be traced back to the 1882 opening of the Department of Metallurgy and Engineering - one of the founding schools of the University College Sheffield.

The smoking chimneys of the early 20th century have been replaced by lush greenery, with Sheffield boasting around 4.5m trees and more than 250 parks, woodlands and gardens and one third of the city within the bounds of the Peak District National Park. With a total tree cover of more than 18%, Sheffield is one of the most wooded cities in the UK, if not Europe. All of this makes Sheffield the ideal location for those that enjoy outdoor pursuits.

For night owls, you're not going to find yourself at a loose end. Sheffield's night life is famous and the music scene is legendary.

We have the largest regional theatre complex in the UK, the largest independent cinema outside London and the UK's largest Cineworld complex, with 20 screens under one roof.

Our Students' Union has been voted number one for the tenth consecutive year (Times Higher Education Student Experience Survey 2018). The Union has live music, club nights, a 400-seat cinema, shops, an advice centre, travel agent, banks and much more. There are over 150 different clubs and societies to get involved in, so you'll never be short of something to do or someone to do it with.

Like the city, the Department has evolved, bringing in new materials and processes, expanding to meet demand and remaining at the forefront of technology.

But we're proud of our heritage and realise that we wouldn't be where we are today without the hard work and dedication of our predecessors. Much like the city of Sheffield.

Sheffield





The
University
Of
Sheffield.

Sir
Robert
Hadfield
Building.

The Department
Of Materials
Science &
Engineering.

Department.

Your Application

We invite all UK-based applicants to interview on a Departmental Open Day. These days also give applicants the opportunity of getting to know the Department. We read your personal statement and the reference to assess your motivation and to learn more about you.

We take these into account with your predicted grades when deciding your offer. We also consider direct second year entry if you have good overseas qualifications and your previous course overlaps sufficiently with our first year. If you have any queries or require further information, we are always happy to hear from you.



The
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Of
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Department
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Engineering.

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The content of our courses is reviewed annually to make sure it is up-to-date and relevant. This is in response to discoveries through our world-leading research; funding changes; professional accreditation requirements; student or employer feedback; outcomes of reviews; and variations in staff or student numbers.

While every effort has been made to ensure the accuracy of the information in this publication, for the reasons detailed above, changes may need to be made to modules, courses, entry requirements and fees between the date of this publication and the start of your course.

This publication is correct as at the time of print, but please see www.sheffield.ac.uk/materials for the most up-to-date information about our courses. If there is any inconsistency between this publication and www.sheffield.ac.uk/materials, the information on the website should be taken as correct.

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