For nearly 50 years Materials Science and Engineering has been a core strength at Loughborough University.

Everything that we make is based on materials in one form or another and they underpin just about every modern technological development. Our work in the Department is focused on the science, engineering, design, processing and use of materials. There are many exciting new developments ahead and they will all require either completely new materials or existing materials with enhanced properties.

We provide our students with the knowledge and skills to be able to contribute to the development of these materials, so that they can pursue exciting careers at the cutting edge of technology. The Department’s close links with industry and established industrial placement scheme open doors to these careers and provide our current students with an enhanced learning experience, so that on graduation they are ready for the workplace and highly sought after by employers. We have close working relationships with Airbus, Avon, BAE Systems, E.ON, Jaguar Land Rover, Morgan Crucible, Rolls-Royce, PepsiCo, Siemens and Unilever to name just a very few of the many UK and overseas companies we deal with.

We have a student population in the region of 350, who are supported by our highly experienced academic and technical staff. We also possess state-of-the-art, world-class facilities for use in materials synthesis, processing and characterisation, which support our research and teaching activities. We feel this sets the stage for a first-class university experience, and our own students feel the same too, as we have been ranked 1st for Materials in the National Student Survey for five out of the last six years!

We hope that you decide to make Loughborough your first choice and that this brochure reveals some of the exciting opportunities that a degree in Materials can offer.

Professor Rachel Thomson
Head of Materials
WHY CHOOSE
LOUGHBOROUGH
UNIVERSITY?

At the Centre of it All
Based in the heart of the rolling English countryside, but with easy access to the rest of the UK, Loughborough University welcomes students from all over the world. The University enjoys a well-established reputation for world-class research, innovative teaching and learning and industry relevance. Our great all-round student experience develops well-rounded graduates. Indeed, our graduates are so highly regarded by a wide range of employers that in the 2013 Graduate Market Review (High Fliers) ... you plan your career, our careers fairs and drop-in sessions could put your CV in the hands of your future employer.

Home from Home
Almost 6,000 of our students live in University halls of residence on (or very close to) campus and we offer the widest range of accommodation to suit all budgets and catering preferences. Undergraduates who confirm Loughborough as their first choice before the end of July are guaranteed a place in our halls. For further information: www.lboro.ac.uk/accommodation

Loughborough Life
The town itself is a thriving market town that offers you the convenience of shopping, dining, entertainment, nightlife and amenities on your doorstep. The cost of living is also considerably lower than most UK cities. However, with its central location, close proximity to Nottingham, Derby and Leicester; and rail links to London, city lights are always within easy reach, and Loughborough is a great base for exploring the county and beyond.

YOUR JOURNEY STARTS HERE
Choosing where to study is one of the hardest decisions you’ll make in life. Loughborough University makes it easier by offering a mix of excellent facilities and opportunities – all on a superb 438-acre single-site campus, bringing together 17,000 students and staff from over 100 different countries, there is a strong sense of community and a real buzz about the University that has seen us voted England’s Best Student Experience six years in a row.

Study Resources and Support
With so much going on, it’s not for you’re here for Loughborough has a strong tradition of providing excellent student support - from state-of-the-art IT facilities available around the clock, award-winning mathematics support and library services. Wireless networking is available across the campus. In addition, we provide advice and support on careers, personal wellbeing, health, finance and legal matters, as well as support for students with disabilities, additional needs and mental health issues.

Industry’s Choice
We are proud of our strong relationships with industry, commerce and the professions in teaching, research and enterprise. Our collaborative links with global blue-chip companies like Ford, adidas, Rolls-Royce and Caterpillar ensure the relevance of our commercial research. They also mean our degree courses are up-to-date and informed by the needs of organisations, with sponsorships, prizes and guest speakers adding value to your learning experience. Professional placement opportunities are also offered on many courses, giving you the chance to gain valuable work experience.

Research that Matters
The most recent Research Assessment Exercise (RAE) confirmed Loughborough as one of the country’s Top-20 research universities with 18% of our research considered “world-leading”. With many academics involved in cutting-edge research addressing the immediate problems in social, economic and industrial practice, their work will directly inform your learning experience.

For more information visit: www.lboro.ac.uk/research

An International Perspective
Loughborough has a proud history of welcoming students from around the world and, today, is home to more than 2,500 international students who contribute greatly to a vibrant, diverse and lively community. Helping you settle in is a range of tailored support services, including bespoke English language learning courses, advice and support, a one-week residential orientation course held before the academic year, and the International Students’ Association - a friendly student-led association that helps with problems and organises social events. More information for international students can be found at: www.lboro.ac.uk/international

Sport for All
Of course, Loughborough is renowned worldwide for sporting excellence and counts Sebastian Coe, Paula Radcliffe and Steve Backley among its famous sporting alumni. However, the focus here is on providing sporting opportunities to all levels: from elite athlete to enthusiastic beginner. At Loughborough, there is an excellent array of sporting facilities covering the widest possible range of sports, including tennis, squash and badminton courts, sports pitches, all-weather play areas, the National Cricket Centre, the athletics stadium and our 50-metre swimming pool.

CONSISTENTLY HIGHLY RATED IN THE NATIONAL STUDENT SATISFACTION SURVEY
WHY CHOOSE MATERIALS?

Everything you see, use and buy, that has been manufactured or built, is made of one material or another and so has the science and engineering of materials at its very heart.

Any company in any industry making any item has to make the fundamental decision of what to make it from and how to process it.

- Is your first priority cost?
- Is your first priority performance?
- Is your first priority sustainability?

If your answer is yes to any of these or you want a balanced combination of properties: YOU NEED A MATERIALS ENGINEER!

The Impact of Materials

Developments and improvements in materials have played a major part in shaping today’s high technology world. Consider your mobile phone. Not many years ago they simply did not exist, now they are small enough to fit in your pocket and yet contain a whole range of capabilities from internet access to sat nav, apps, games and music. Before long, they will be merged into your wrist watch and controlled by speaking to them.

At the heart of this and other 21st century technologies is the science and engineering of materials. It has provided the fundamental understanding necessary to unlock the potential offered by metals, ceramics, plastics and their composites.

The Applications of Materials

A wide range of major industrial sectors rely on the latest materials innovations, from superalloys used in jet aircraft turbine blades operating at temperatures above their melting point, to packaging materials that minimise environmental impact. Here are some more examples of the impact and influence of materials on the modern world.

- Lightweight high strength composites moulded without seams to produce huge wind turbine blades that are stiff, strong, light and have minimal drag to get the most efficient power from wind.
- Advances in surface engineering and adhesion mean that glued joints can be used in the most demanding of applications such as cars, aeroplanes and trains, for more streamlined and fuel efficient designs.
- Materials developed to work in harmony with the human body mean ever more successful implants and replacement joint operations can be performed to improve the quality of people’s lives.
- Nanotechnologies that allow electronic components to be made ever-smaller, shrinking the size of everyday objects whilst improving their capabilities.

What Does a Materials Student Study?

Materials students gain an in-depth knowledge of what things are made of, how they are made and why. This provides a great opportunity to use their science and maths skills in a practical way across every different industrial sector.

Engineering materials can be split into three main areas; metals, polymers and ceramics, which all feature in our courses in a balanced way, along with sub-categories such as nanomaterials and composites.

Starting with the basics of what makes materials the way they are, students consider the development and improvement of new and existing materials. They investigate their structure, processing and properties and how materials can be used to design and make new and improved products. In their final year, students do a genuine research or design project that can result in better materials for society.

“All the best engineering products are unlocked as a solution by the materials they have used”.

Richard Simkins, Rolls-Royce (Loughborough Materials Graduate)
Having graduated with a BEng in Design with Materials Engineering, I began working for Greene Tweed (a global technology leader in polymeric sealing solutions) in July 2012. My induction experience with the company was incredible; it included two trips to sites based in America (Philadelphia and Houston) where I had the opportunity to meet other graduates at the company. Greene Tweed have been exceptional at developing my skill set through various programmes such as SolidWorks Certification, Excel, FMEA and other technical training. My individual development is due to continue through the IMechE where I am currently working towards chartership. In 2008 I began in my current role focussing on developing and implementing new materials technologies for the Body Structure. This involves working closely with many areas of the business, including Research, CAE, Advanced Manufacturing and Body Engineering, as well as external suppliers. One of the highlights of working at JLR is having opportunity to make a key contribution to exciting new vehicle projects. Having been part of the team that developed the recently launched XJ, it’s fantastic to see the product on the road and people’s reactions to it, knowing your investment in its creation.

\[ \text{Jaymini Mistry} \\
\text{BEng Design with Engineering Materials, graduated in 2012. Applications Engineer, Greene, Tweed & Co} \]

At Loughborough Careers Fair that I first met Greene Tweed which ranked among the best universities for graduate employment, and having strong collaborative relationships with leading companies, our graduates are consistently targeted by the UK’s top recruiters, giving you a competitive advantage over other graduates. Having graduated with a BEng in Materials Engineering, I began working for Greene Tweed (a global technology leader in polymeric sealing solutions) in July 2012. My induction experience with the company was incredible; it included two trips to sites based in America (Philadelphia and Houston) where I had the opportunity to meet other graduates at the company. Greene Tweed have been exceptional at developing my skill set through various programmes such as SolidWorks Certification, Excel, FMEA and other technical training. My individual development is due to continue through the IMechE where I am currently working towards chartership. In 2008 I began in my current role focussing on developing and implementing new materials technologies for the Body Structure. This involves working closely with many areas of the business, including Research, CAE, Advanced Manufacturing and Body Engineering, as well as external suppliers. One of the highlights of working at JLR is having opportunity to make a key contribution to exciting new vehicle projects. Having been part of the team that developed the recently launched XJ, it’s fantastic to see the product on the road and people’s reactions to it, knowing your investment in its creation.

My time at Loughborough was invaluable in preparing me for a career in Industry Sectors. The types of job roles available are also very varied; technical roles in areas ranging from design, manufacturing, processing, R&D and testing, to managerial roles in project management, team leadership, technical management, production management, sales and marketing. Employers who have recruited Loughborough Materials graduates often come back to us on a regular basis to recruit and many of our graduates are now in senior roles within those companies.

“\text{At Greene Tweed have been exceptional at developing my skill set through various programmes such as SolidWorks Certification, Excel, FMEA and other technical training. My individual development is due to continue through the IMechE where I am currently working towards chartership.}”

“There are very few fields where it is possible to affect so profoundly the way that humans exist on this small planet of ours, but Materials is one of them. Come and join us in the Department of Materials at Loughborough University and use your future career to really make a difference!”

- Robert Crow

- Dr Sarah Ogden

- Dr David E Clarke, Head of R&D Process Management

“\text{E.ON recognises the importance of pursuing all available technology options to provide cleaner and better energy. In our high technology industry the use of advanced high performance materials, and the skills of the Materials Engineer play an important role in achieving our objectives. Over recent years we have been impressed by the quality of the Loughborough Materials graduates we have recruited and they make a valuable contribution to our new build programmes and energy technologies research.}”

- Joe Stanford, Design with Engineering Materials, 3rd Year (Finalist)

“\text{E.ON New Build and Technology}”

- Joe Stanford, Design with Engineering Materials, 3rd Year (Finalist)

“I was an undergraduate within the Department and decided to stay on to do a PhD, as I had the opportunity to work on a project relating to gas turbine materials which was of real interest to me. The project involved a large research consortium of universities and industrial partners within the UK power generation supply sector. My research was focused on the micro-structural evolution of coated Ni-based superalloys with time and temperature. My role of Materials Engineer at E.ON involves managing a wide range of materials within key companies of the power plant operation. This can include failure investigations of plant components, identifying root causes and recommending actions, as well as on-site visual inspections in order to evaluate the integrity of a component. The job also covers managing research based projects aimed at improving the understanding of current and new materials for more extreme operating conditions in order to reduce emissions. Even though my PhD was in a specialised subject it gave me a wider understanding of the industry, their prime goals and reasoning and how that differs from academia. The PhD also allowed me to meet a number of contacts within key companies of the power industry which inevitably assisted in my employment, and has been beneficial ever since.”

- Dr David E Clarke, Head of R&D Process Management

“A Career in Research

For the very best of our students graduating with a first or upper second class degree there are opportunities to join our community of around 70 PhD students engaged in projects of real-world significance, with some big name industrial partners.

Do you fancy working on a research project designed to develop a material that can survive temperatures as high as 2700°C? Or perhaps one focused on extending the life of our ageing power stations, making genuinely biodegradable plastics, or developing nano-electronic devices? The research that we do in Materials can really change the way that society works.”

- Joe Stanford, Design with Engineering Materials, 3rd Year (Finalist)

- Dr David E Clarke, Head of R&D Process Management

“\text{E.ON New Build and Technology}”

“\text{I’ve secured a long term internship in the Securities Division of Goldman Sachs’ London office which gives me the opportunity to learn about buying and selling financial instruments from some of the World’s brightest minds. During my interviews, it was clear that an Engineering degree from Loughborough was really well respected. It shows you have an aptitude for learning, can think analytically and solve problems whilst still being a rounded and sociable individual with your own story.”}

- Dr Sarah Ogden

- Dr David E Clarke, Head of R&D Process Management

“\text{E.ON New Build and Technology}”
Collaborations

The Department of Materials has enviable links with industry forged over many years, through valuable research collaborations. Our students benefit greatly from these as many of the companies take an active interest in our teaching, providing practical advice and involvement with many of our modules.

Placement Year in Industry

A one-year placement in industry is available on both the MEng and BEng courses. The placement year is optional but is strongly encouraged because of the many benefits it can provide. Students undertake their placement between years 2 and 3 of their degree, however MEng students have the option to take it between years 3 and 4. During the year, an engineer nominated by your employer will supervise you and you will also be visited by your university tutor.

Key Benefits of an Industrial Placement

- improve your job prospects - employers regard placement students as more attractive and many of our students who take a year in industry are offered a permanent job with their placement company when they graduate
- financial benefits - the average salary for a placement student is £16,000 per annum
- professional status - a year of industrial work experience can contribute towards achieving professional Chartered Engineer status
- an opportunity to develop professional skills, such as time management, team working and project management
- an opportunity to put the knowledge gained during your degree into practice within a working environment alongside professional engineers
- award of an additional qualification - the Diploma in Industrial Studies (DIS)
- professional contacts - the placement year is an ideal opportunity to start making industrial contacts at your host company and amongst their customers and suppliers

Research of Real World Importance

Many of the final year projects undertaken by our undergraduates are defined and sponsored by industrial partners, or form a contributing part of a bigger industry sponsored piece of research that one of our research teams are working on. Much of the Department’s research is of real world importance helping to meet the global challenges we face. Here are some of our well-known Research Partners:

- Airbus
- Abbot Power
- Anson Packaging
- AP Racing
- Avon
- BASF
- Bentley Motors
- Caterpillar
- Clariant
- Morgan Technical
- DEFRa
- Dassault Babcock
- DSTL
- E.on
- Exxon Mobil
- Federal Mogul
- Henkel
- Jaguar Land Rover
- MaxCommit
- MacDermid
- Ceramic
- Pulpico
- Rolls-Royce
- Siemens
- Tata Steel
- Teijin Aramid
- Unilever

Membership of Professional Institutes and Accreditation

The Department of Materials is committed to try and offer the best educational experience we can and as part of this we strongly believe in the beneficial role professional institutes and Industry bodies can play. In line with this philosophy the Department finances the enrolment of all new students as members of the IOM3 (the Institute of Materials, Minerals and Mining). In the case of Design with Engineering Materials Students, they are additionally enrolled as members of the EID (the Institution of Engineering Designers). Our degree programmes are accredited by the IOM3 and EID making it more straightforward for our graduates to satisfy the requirements for Incorporated and Chartered Engineer Status once they have completed a period working in industry.

Finding a Placement

Our students are keenly sought after by companies in a wide variety of sectors who know Loughborough University students are versatile and well prepared to take on a variety of tasks. Each year normally we have more placement opportunities than students to fill them.

Loughborough placement students have consistently made excellent contributions to technical projects and investigations into current and future products. In parallel, the individuals have developed new skills and put into practice their academic knowledge.

Andrew A Huggie, Manager, Materials Engineering, Jaguar Land Rover

“Loughborough placement student have consistently made excellent contributions to technical projects and investigations into current and future products. In parallel, the individuals have developed new skills and put into practice their academic knowledge.”

Contact:
Dr Bala Vaidhyanathan  Email: B.Vaidhyanathan@lboro.ac.uk

Companies providing recent student placements:
- 3M
- Aerobrake
- Abbot UK
- AMG-Mercedes High Performance Engines
- Anson Packaging
- Bentley Motors
- BMW Group - Mini
- Bombardier
- Ceramic
- Crown Packaging
- Curtiss
- Darchem
- Diageo
- EADS Astrium
- Eads Astrium
- E.on
- Faurecia
- Feiroc
- GKN
- GlassSmithKline
- Inmoca
- Jaguar Land Rover
- Johnson Matthey
- Leoal Wiring Systems
- Morgan Carbon
- Morgan Crucible
- Morgan Technical
- Osu Kumpu
- Pirelli
- Proctor and Gamble
- Ptsell
- Rockit Benckiser
- Rolls-royce
- Rosiex
- Saillou Consulting
- Sigmazone
- Smiths Medical
- SPS Technologies
- Tata Steel
- Toyota
- Unilever

”The placement scheme offered to me by Bentley complemented my degree choice better than any other and gave me a chance to put into practice much of the theory I have learnt over the course of my first and second year at Loughborough. On a day to day basis the work varies hugely depending on what the environment within Bentley is like at the time. New developments are constantly being made to processes in the plant and parts for the vehicles and these changes all require in depth testing before being signed off.”

Joseph Howe, BEng Automotive Materials Student, DIS placement year with Bentley

WATCH ADAM KENT TALK ABOUT HIS PLACEMENT AT ROLLS-ROYCE

Why Study Materials Engineering at Loughborough University?

Materials Engineering is a challenging, inter-disciplinary subject offering considerable variety and exceptional opportunity for future careers.

The course is accredited by the professional body, the Institute of Materials, Minerals and Mining (IOM3) and all of our students are entitled as members and we pay your membership fee. The course has also been designed to meet the current requirements of industry and to allow progression towards Chartered Engineer status.

Materials at Loughborough is ranked 2nd by The Guardian University Guide and we have been voted 1st overall for Materials, in the National Student Survey, for five out of the last six years. In addition 95% of our Department’s research is recognised as being of ‘international standard’, our research feeds directly into our teaching which means you are receiving a cutting edge education.

With the added option of undertaking a salaried industrial placement at home or abroad, our course really does offer you the full package.

About the Course

The course is a comprehensive programme of modules that deliver both the theory and the essential industrial relevance lessons learnt from graduates. The course content encompasses all aspects of materials; their selection, manufacture, testing, assembly and environmental impact both during production and at the end of life. Through a careful balance of lectures, practical sessions and case studies, students develop a thorough understanding of the properties and capabilities of metals, polymers, ceramics and composites, which can then be applied to a wide range of industrial contexts including aerospace, automotive, power generation and distribution. If and manufacturing amongst many others. You will also learn how to develop and process new materials as so they can be used within workable components and effectively drive new developments in products and technology. The management modules and project work form an important part of this course, preparing students for the workplace by developing crucial transferable skills.

Whilst the broad philosophy of the MEng and BEng is the same, MEng students are required to study a wider range of technical modules with additional depth, including an additional Group Project in their final year.

Example Projects

- Investigating corrosion in aerospace alloys
- Developing 3000°C heat shields for hypersonic aircraft
- Predicting failure in power plant alloy steel components
- Investigating new food packaging materials
- Assessing the claims and properties of “environmentally friendly” materials
- Using novel biomaterials in polymer composites
- Modifying the properties of natural rubber for improved performance
- Developing lightweight metal ceramic composites for ballistic protection
- Laser processing of steels
- Using microwaves for enhanced ceramics processing

Part A (Year 1)

Compulsory modules
- Introduction to Materials
- CAD/Engineering Design and Communication
- Experimental Skills
- Materials Characterisation and Mechanics
- Advanced Materials Characterisation
- Thermodynamics and Phase Equilibria
- Business Studies

Part B (Year 2)

Compulsory modules
- Metals and Ceramics
- Polymers and Composites
- Production Project
- Product Design and Failure
- Sustainability, Recycling and the Environment
- Electromechanical Technology
- Mathematics for Materials

Optional Placement Year (Year 3)

See pages 5-6.

Part C (Year 3 or 4)

(2BEng Final Year, MEng Year 3)

Compulsory modules
- Sustainability, Recycling and the Environment
- Advanced Manufacturing
- Design and Manufacture with Composites
- Project Management
- Industrial Case Studies
- Tomorrow’s Materials
- Materials Characterisation
- Modelling
- Masters Individual Project


Placement Year
✔ Additional Award
✔

Learning and Teaching

As well as teaching the theory and practice of Materials, this course is designed to produce graduates trained in professional skills such as team working, presentation skills, project management and report writing. The course is taught through a range of lectures, tutorials, laboratory and workshop practicals. Extensive group and individual projects are included, linked to real-life materials engineering problems.

The MEng final year also includes a one week residential outdoor management course: Teamwork and Leadership.

There are also opportunities to study modules in European languages as part of your degree.

Staff

The Department of Materials has a team of 19 lecturers who are all engaged in industry sponsored research at the cutting edge of involvement of lecturers from other Loughborough departments and visiting lectures from our industrial partners.

Example Projects

- Investigating corrosion in aerospace alloys
- Developing 3000°C heat shields for hypersonic aircraft
- Predicting failure in power plant alloy steel components
- Investigating new food packaging materials
- Assessing the claims and properties of “environmentally friendly” materials
- Using novel biomaterials in polymer composites
- Modifying the properties of natural rubber for improved performance
- Developing lightweight metal ceramic composites for ballistic protection
- Laser processing of steels
- Using microwaves for enhanced ceramics processing

MEng (Hons): 4 years full-time
UCAS code: J903

MEng (Hons) DIS*: 5 years full-time sandwich
UCAS code: J900

BEng (Hons): 3 years full-time
UCAS code: J500

BEng (Hons) DIS*: 4 years full-time
UCAS code: J501

For more information or to apply, visit www.lboro.ac.uk/materials
AUTOMOTIVE MATERIALS

Why Study Automotive Materials at Loughborough University?

Automotive Materials provides a comprehensive materials engineering programme designed to meet the needs of the automotive and transport sector and prepare its students for an exciting career in one of the largest and most important industrial markets in the world. Loughborough has a long established history of teaching and research in automotive materials engineering and has been recognised by major automotive companies such as Ford, Jaguar Land Rover and Rolls-Royce, as leaders in education and research in the field.

The course is accredited by the professional body, the Institute of Materials, Minerals and Mining (IOM3) and all of our students are enrolled as members and we pay your membership fee. The course has also been designed to meet the current requirements of industry and to allow progression towards Chartered Engineer status.

Materials at Loughborough is ranked 2nd by The Guardian University Guide and we have been voted 1st overall for Materials, in the National Student Survey, for five out of the last six years. In addition 95% of our Department’s research is recognised as being of an ‘international standard’, our research feeds directly into our teaching which means you are receiving a cutting edge education.

With the added option of undertaking a salaried industrial placement at home or abroad, our course really does offer you the full package.

About the Course

Graduates of this degree have excellent job prospects and are highly sought after because of their unique blend of materials engineering knowledge linked to an in-depth appreciation of vehicle and engine design. This knowledge is also coupled with management skills and the international awareness required by today’s professional engineers.

Modern vehicles are built from a wide variety and complex mix of materials and every component must meet very stringent guidelines for safety, performance and environmental impact. The course content is therefore designed to provide in-depth knowledge of materials with a specific emphasis on applications within the automotive sector so that graduates are able to tackle these challenges and balance competing priorities.

Whilst the broad philosophy of the MEng and BEng is the same, MEng students are required to study a wider range of technical subjects with additional depth, including an additional Group Project in Part D.

Example Projects

- Improving the performance of materials in Hydrogen Fuel Cells
- Evaluating adhesives used in car body structures
- Development of alloys for high performance engines
- Characterisation of commercial anti-fog visor inserts
- Using recycled materials in automotive applications
- The performance of materials used in advanced braking systems
- Fuel cell membranes prepared using polymer/ceramic nanocomposites
- Evaluating new rubber formulations in automotive applications
- CAD/CFD analysis - injection moulded plastics for automotive applications

Part A (Year 1)

Compulsory modules

- Vehicle Design, Development and Manufacture
- Introduction to Materials
- CAD/Engineering Design and Communication
- Experimental Skills
- Maths and Mechanics for Materials
- Product Design and Materials Selection
- Thermodynamics and Phase Equilibria

Part B (Year 2)

Compulsory modules

- Vehicle Design
- Automotive Crash Protection
- Internal Combustion Engines
- Metals and Ceramics
- Polymers and Composites
- Materials Characterisation and Mechancs
- Mathematics for Materials

Optional Placement Year (Year 3)

Part C (Year 3 or 4) (BEng Final Year)

Compulsory modules

- Vehicle and Component Design
- Powertrain Technologies
- Sustainability, Recycling and the Environment
- Design and Manufacture with Composites
- Fracture and Failure
- Surface Engineering
- Industrial Case Studies
- Tomorrow’s Materials
- Individual Project

Part C (Year 3 or 4) (MEng Final Year)

Compulsory modules

- Vehicle and Component Design
- Powertrain Technologies
- Sustainability, Recycling and the Environment
- Design and Manufacture with Composites
- Fracture and Failure
- Surface Engineering
- Advanced Materials
- Masters Individual Project

Placement Year

✔ Additional Award

Study Abroad

✔ Accredited

Entry Criteria

MEng A Level: 340 points (typically AAB) from three A Levels including two from Maths, Physics or Chemistry. Two AS Levels may be substituted for one A Level.

BEng A Level: 320 points (typically ABB) from three A Levels including two from Maths, Physics or Chemistry. Two AS Levels may be substituted for one A Level.

BTEC ND: D/D/M

IB: 32 points with 5 in any two from Maths, Physics or Chemistry at a higher level

Entry requirements correct at the time of print. Please check our website for the latest version and other qualifications.

Learning and Teaching

As well as teaching the theory and practice of Materials, this course is designed to produce graduates trained in professional skills such as team working, presentation skills, project management and report writing. The course is taught through a range of lectures, tutorials, laboratory and workshop practicals. Extensive group and individual projects are included, linked to real-life materials engineering problems.

The MEng final year also includes a one week residential outdoor management course: Teamwork and Leadership. There are also opportunities to study modules in European languages as part of your degree.

Staff

The Department of Materials has a team of 19 lecturers who are all engaged in industry sponsored research at the cutting edge of involvement of lecturers from other Loughborough departments and visiting lecturers from our industrial partners.

CONTACT DETAILS FOR ALL COURSES

E: mp-admissions@lboro.ac.uk

www.lboro.ac.uk/materials

E: admissions@lboro.ac.uk

www.lboro.ac.uk/materials

Career Opportunities

From well known companies like Jaguar Land Rover, Valeo and Perkins Engines to component manufacturers and specialist engineering companies serving the automotive industry the range of destinations for our graduates is wide. Because of its all round comprehensive nature, graduates of Automotive Materials are also equipped for a wide range of Materials Engineering career options.

Companies with whom our students have found employment include:

- Jaguar Land Rover - Engineer, Project Manager and Team Leader
- Federal Mogul - Graduate Trainee Engineer
- Bentley - Graduate Engineer
- Nissan - Graduate Engineer
- Magna-Pana - Design Engineer
- Scott Bader - Applications Engineer
- Electrotech - Corision Engineer

E: mp-admissions@lboro.ac.uk

www.lboro.ac.uk/materials

CONTACT DETAILS FOR ALL COURSES

E: admissions@lboro.ac.uk

www.lboro.ac.uk/materials
DESIGN WITH ENGINEERING MATERIALS

MEng (Hons): 4 years full-time
UCAS code: H15
MEng (Hons) DIS*: 5 years full-time sandwich
UCAS code: H11M
BEng (Hons): 3 years full-time
UCAS code: H15
BEng (Hons) DIS*: 4 years full-time
UCAS code: H11M

Example Projects
- Design a Security System for Intermediate Bulk Containers (IBCs)
- Improving the efficiency of the parachute packing process
- Medical packaging design
- "Powerpack!" How to package energy bars for cyclists or athletes
- Designing products for use in wet or gristy conditions
- Design a new drop weight testing device for ceramics
- Design a military and capable of optimising deployment efficiency for infantry soldiers
- An interactive kit to introduce inclusive design into schools
- Improved design and materials for mobility scooters
- Low cost, high quality microscopes for teaching in schools

Why Study Design with Engineering Materials at Loughborough University?

Design with Engineering Materials is a comprehensive course balancing the fundamentals of product and industrial design with the key elements of materials selection and engineering. This is an interdisciplinary course with significant input from the University’s Design School ergonomics specialists. We offer first class laboratories, including materials processing, characterisation, microscopy and computing facilities, and a design studio with CAD/CAM softwares and prototyping capability; in addition, access to new, state-of-art facilities in the Design School.

The course is accredited by two professional bodies, the Institute of Materials, Minerals and Mining (IOM3) and the Institution of Engineering Designers (IED), all of our students are enrolled as members and we pay your membership fees. The course has also been designed to meet the current requirements of industry and to allow progression towards Chartered Engineer status.

Materials at Loughborough is ranked 2nd by The Guardian University Guide and we have been voted 1st overall for Materials, in the National Student Survey, for five out of the last six years. In addition 95% of our Department’s research is recognised as being of an ‘international standard’, our research feeds directly into our teaching, which means you are receiving a cutting edge education. Our Design School is renowned for its expertise in Ergonomics, has been offering undergraduate courses for 40 years and is ranked 10th in the Times Good University Guide.

With the added option of undertaking a salarioed industrial placement at home or abroad, our course really does offer you the full package.

About the Course

Effective design is the key to the future development of society. The next generation of designers will face a huge but crucially important task as we learn how to combine our demands for the luxuries and quality of modern life, with the need to sustain the planet’s resources. Functionally, safety, performance, streamlining, end-of-life, re-use and recycling are all competing priorities which a materials specialist must consider and balance in order to achieve effective design.

This course will equip students for a career in design as a materials specialist. It is well suited to those who like to understand how and why products work, rather than just the aesthetics and external appearance. Through a careful balance of lectures, practicals and project work, students learn how to apply the principles of ergonomics, engineering and materials technologies in developing design solutions. Up-to-the-minute, design case studies from an important part of the course and prepare students for the current issues and challenges facing product designers.

The course has a varied content and brings together the expertise and facilities of several different disciplines, including the ergonomics specialists in our Design School. The inter-disciplinary nature of the course also opens up a diverse range of career paths from across a number of different industry sectors.

Learning and Teaching

As well as teaching the theory and practice of Design with Engineering Materials, this course is designed to produce graduates trained in professional skills such as team working, presentation skills, project management and report writing. The course is taught through a range of lectures, tutorials, laboratory and workshop practicals. Extensive group and individual projects are included, linked to real-life materials engineering problems.

Staff

The Department of Materials has a team of 19 lecturers who are all engaged in industry sponsored research at the cutting edge of their specialist areas. The design course draws upon the expertise of the ergonomics specialists at the Loughborough Design School. Visiting lectures from our industrial partners enhance the programme with industrial case studies.
I went to secondary school in Derby where I did my Maths, Physics and Chemistry A-Levels. I always knew I wanted to be an engineer but it wasn’t until I was in Sixth Form that I thought about a career in automotive materials. I chose Loughborough for a number of reasons. Firstly, it has a world class reputation in both Engineering and Sport. I wanted a University that was well respected for my subject and course to stand me in good stead in the graduate job market. At the same time, I wanted an experience outside of the lecture theatre too. Loughborough has an incredible sporting history with unrivalled facilities and opportunities.

The Department has a great reputation in the Engineering world and this is shown by the excellent links we have with some really prestigious companies (JLR, Bentley etc). I enjoy the fact that my course is always evolving and tries to produce engineers who can have a real impact in industry. We don’t just focus on learning from the past, we’re encouraged to shape the future.

I’m living in William Morris Hall this year which is great, I’m also one of the team captains for the local town hockey club which takes up quite a bit of my time, whether playing the game or doing the team socials. There are always plenty of inter-hall sports, nights out and charity fundraising events going on as well.

I did my placement year with AMG Mercedes and I found it gave me greater motivation to achieve a good degree, due to the invaluable experience which you can’t get from lectures alone. The experience allowed me to network with a number of important people in industry and also gave a greater insight into an engineering company with regards to its structure and operation.

In my spare time, I play football for one of the University hall teams and I am also a member of the Afro-Caribbean Society (ACS). I have really enjoyed the opportunities to meet different people through the various events and socials.

I really enjoy my course. Typically, my day involves lectures in the morning, followed by lab sessions relating to what we have covered in lectures during the afternoon. In the lab sessions, we work in groups on a mini-project and are guided by the technicians throughout. The module descriptions are great and they really help and get on well with all of the groups. All of the lab facilities are based within the Department which is really handy.

The Department has quite a lot of socials which often finish up at the Union. These events are a great opportunity to meet other Materials students outside of your own year group. Whenever you’re in the Department, there are always people around you to chat to – it’s a really friendly atmosphere. I live in a shared house in the town centre now but I’m still affiliated to Falk Hall of Residence, so I sometimes play hockey or netball for the Hall team or go out on Hall socials. There’s always loads to do here so I’ve certainly developed my time management skills whilst at Loughborough!

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I did my placement year at Ross Ceramics a Roll-Royce subsidiary company in Derby, working on ceramic injection moulding. I’d always recommend people to consider a placement as it’s a great experience and helps you understand business and some of the topics in the course better.

Before coming to Loughborough I did my A-Levels in Maths, Physics and Music at an all girls school in Essex. I really liked the atmosphere on campus when I came to the Open Day and after seeing how well Loughborough was doing in the league tables, I decided to apply.

The Materials Engineering course allows me to continue studying Maths and Physics but also teaches me practical applications of that knowledge. The Materials side of the course is really interesting – you’d be amazed how much there is to know about just one metal! Clubs and societies are a big part of student life here. I’m part of the Union Dance Club. We do all kinds of dance including contemporary, ballet, hip hop and jazz. We compete against other uni dance clubs and also perform at the Union sometimes. We recently performed there on Halloween night which was great!
Your Study Environment

As a student at Loughborough you will be assigned a personal tutor who will provide advice and help you to choose your subject options. In addition to teaching you theoretical knowledge, we provide you with the skills to apply this knowledge to solve real science and engineering problems. Studying will be a combination of lectures, tutorials, laboratory experiments and practical engineering exercises. The Department of Materials has excellent facilities for students, which include recently refurbished teaching laboratories, a design studio with 3D printer, a dedicated open access computer laboratory, an extensive processing laboratory and pilot plant area and a large comfortable foyer area with collaboration tables favoured by many students for team project work. In addition, when students advance to their final year projects they have access to the Loughborough Materials Characterisation Centre (LMCC) which is one of the leading facilities of its type in Europe, equipped with a multitude of advanced electron microscopes and spectroscopy devices.

Course Structure (MEng and BEng)
The academic year is divided into two semesters that are each fifteen weeks long. Each semester comprises twelve teaching weeks followed by exams. Within these two semesters there are the traditional three terms with breaks at Christmas and Easter. Wednesday afternoons are normally left free by all departments so students can enjoy sports and other activities across the entire campus.

All of the Materials MEng/BEng courses can be studied with or without an industrial placement year (see below and page 19). Courses which lead to MEng therefore take four or five years, while those leading to BEng take three or four years. The first two years of a BEng or MEng share the same format and structure, with a good mix of theory, application and practical content from day one. The MEng courses differ from the BEng courses by offering the opportunity to study technical and management topics at a more advanced level. The individual project in the penultimate year of the MEng is a more substantial piece of work than the BEng final year project and in addition MEng students do a group masters project in their final year. Many projects are sponsored by an industrial collaborator and represent important real life materials engineering investigations.

Course Structure

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Formulas and Study and Research

The Department supports a student-led team to design and test a new Formula Student race car each year. The Loughborough Motorsport Team is an active component of the Formula Student competition in the UK and Europe and involves students from a wide range of degree courses. Involvement with the Loughborough Motorsport Team is voluntary but all Automotive Materials students take a compulsory third year module to support the design and development of specific components within the Formula Student car.

Defence Technical Undergraduate Scheme (DTUS)
The DTUS scheme is set up by the Ministry of Defence to support sponsored students studying for engineering and science degrees, all of whom are committed to become officers in one of the services (Army, Royal Navy, Royal Air Force, Civil Service). Loughborough is one of six UK universities selected to take part in the scheme. To find out more about Loughborough’s typhoon squadron, visit: www.typhoon squadron.com

The Unitech Scheme

Exceptional students have the opportunity to apply to join the Unitech Scheme. Loughborough is unique as the only UK member University of the prestigious UNITECH International Society’s industrial placement and exchange programme, which includes other top European Universities such as RWTH Aachen, Chaira and ETH Zurich, and aims to develop future senior engineers in the global marketplace. The scheme brings together international higher education institutions and corporate partners to prepare top engineering students for their professional future by spending a semester studying at a leading European university and providing a work placement with a top multinational engineering company.

To find out more about Unitech visit: www.unitech-international.org

Postgraduate Study and Research

Our department is a vibrant and active research environment with an annual research income in excess of £2m and approximately one third is from industry, with industrial involvement in almost all our research programmes. We have a thriving postgraduate student community with approximately 70 students engaged in research and 65 studying for taught masters degrees. Our postgraduate student tutors have a substantial experience of our staff and postgraduate research in Materials offers the chance to work on projects of real-world significance, many of which feed into improvements in life for everyone.

There is a steady demand for research students and each year a number of our best students will stay with us having secured a funded PhD or EngD place, which covers all fees and pays a tax free living allowance called a stipend. Because it is a big decision whether to go out and find a job or undertake a research degree, we offer our undergraduates a number of summer research placement opportunities to get a broader idea of what staying on to do research for a PhD or EngD would be like.

Postgraduate Research Degrees

We offer three different types of research degree:

- MPhil - An MPhil degree usually requires two years of full-time study and is examined by the submission of a thesis.
- PhD - A PhD degree usually requires three years of full-time study. Initial registration is usually for an MPhil degree thus giving the option of either completing an MPhil after two years or transferring to a PhD if progress is satisfactory. The PhD is examined by submission of a thesis.
- EngD - The Engineering Doctorate (EngD) is a four year programme and is a different route to a postgraduate research qualification, with about 3 years spent conducting research in industry.

Postgraduate Taught Masters

In addition to research we also offer two taught Masters courses for students wanting to develop a deeper understanding and specialise in particular aspects of materials.

- MSc Polymer Science and Technology
- MSc Materials Science and Technology

"I did my undergraduate degree in Sports Technology at Loughborough and decided I wanted to continue my education at the University as I love the student life here. After completing several modules on polymers during my undergraduate degree at Loughborough, I developed a real interest in the subject of Materials and so decided to apply to study a Masters in Polymer Science and Technology in the Department of Materials. The course has given me some really useful knowledge and skills that can be transferred into industry in my future career". - Sam Swinbourne, MSc Student, Polymer Science and Technology

Materials Research

Materials is a strategic research area, and the Group are addressing key challenges, particularly in the area of lightweight construction for ultra high speed trains, and high temperature resistance for power generation.

Energy Materials

The Group focus on processing, properties and characterisation of engineering ceramic materials. Projects include ultra high temperature heat shielding, ceramic braking systems and improved ceramic/carbon composites with improved electrical properties.

Advanced Ceramics

Advanced Polymers

Advanced Polymers

This is the large and probably biggest research group in the Department. Activities range from polymerisation processes, through surface properties and finishing to manufacture and recycling technologies.

Advanced Polymers

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Fees and Funding

Tuition Fees
Loughborough University will charge the following annual fees for full-time UK/EU entrants in 2013/14:

- All undergraduate degree courses £9,000
- Science and Engineering Foundation Studies £9,000
- Sandwich placement or year abroad £800

Student Loan for Living Costs
To help with living costs, eligible students permanently resident in the UK will also be able to take out a student loan. The amount depends on where you live and where you are studying.

For further information contact Student Finance England.

Government Maintenance Grant
In addition to the student loan, students from low income families may be eligible for a maintenance grant from the Government. Further information on how to apply for this financial assistance can be obtained from Student Finance England.

Access to Learning Fund
The University has its own Access to Learning Fund which exists to provide assistance for UK students who experience severe hardship. Further information is available from the Student Advice and Support Service:

www.lboro.ac.uk/studentsupportcentre

Scholarships
Various scholarships are available for both UK and international students. For more information visit: www.lboro.ac.uk/funding

Get in Touch
To find out more about what Loughborough University can offer, please feel free to get in touch: T: +44 (0)1509 223165 E: mp-admissions@lboro.ac.uk

Open Days
Coming to one of our Open Days is the best way of sampling the Loughborough Experience for yourself. It gives you the chance to meet lectures and students from the courses you are interested in, attend talks on subjects and department tours, take a guided tour of our campus, view Halls of Residence and check out the Students’ Union.

Full details of upcoming Open Day dates and how to register can be found at www.lboro.ac.uk/opendays

“I would tell anyone considering Loughborough to come to an Open Day. The atmosphere got me excited to study here.”
Robyn Potter, BSc student

How to find us
Loughborough is at the heart of England in the northernmost part of the county of Leicestershire and being centrally placed it is well served by road, rail and air.

Main line road and rail networks link Loughborough directly with the rest of the country and London is one and a half hours away by train, Birmingham one hour and Manchester and Leeds around two hours.

Loughborough’s nearest motorway link is the M1; the campus is just two miles from Junction 23. The University is clearly signed on all the other main approach roads to Loughborough.

There are regular scheduled flights from UK, European and international destinations to East Midlands Airport, only 7 miles away.

Sat Nav users should use this postcode: LE11 3TZ

For full details of how to find us by car or public transport visit www.lboro.ac.uk/about/findus.html