The University Of Sheffield.

Department Of Materials Science & Engineering

Course Information
2020 Entry

MEng Metallurgy
UCAS Code: J200

This course covers all aspects of Materials Science and Engineering, including both the fundamental science behind the behaviour of materials, and how they are processed and used industrially, with a particular focus on metals.

There is a mix of lecture courses, practical work, tutorials and experience of projects, both in an academic and industrial setting.

Year 1

The first year of the course is intended to build the fundamental background knowledge required for all Materials Science and Engineering study. As such this year contains introductory courses across a broad range of key Materials topics.

Core Modules **100/120 credits**

Courses introduce the chemistry of materials (how atoms arrange themselves in crystalline materials and how polymers are formed), microstructure, mechanical properties of materials and their use in structural applications, thermodynamics and energy and how these relate to materials, magnetic, electrical and optical properties, natural and replacement biomaterials, nanomaterials, the life cycle of materials and the key elements of mathematics. Specialist software available during the course and important digital skills are also covered.

Optional Modules **20/120 credits**

There are also options choosing either specialist materials / biomaterials components, modern languages or management.

Other parts of the course

Lecture courses are supported by a program of practicals and tutorials. You will also participate in the week-long Global Engineering Challenge, working in multidisciplinary teams with other engineers to come up with solutions to sustainable development needs.

Year 2

In the second year the ideas from year 1 are developed further, with a number of courses that build directly on first year topics. Metals begin to be focussed on specifically, and processing and manufacturing considered.

Core Modules **100/120 credits**

Topics explored further include the mechanical behaviour and deformation of materials, microstructure and thermodynamics, as well as underpinning mathematics.

New topics include functional materials (where they are used for electrical, magnetic or similar applications), formal methods for the selection of materials for different applications are presented, along with industrial materials processing from primary production to final component manufacture.

Optional Modules **20/120 credits**

There are opportunities to select topics on current materials research, further biomaterials or materials and energy (conventional, nuclear and renewable generation, batteries and storage), as well as further study of language or management.

Other parts of the course

Lecture courses are supported by a further program of practicals and tutorials. There is another week-long project with other engineers (Engineering: You're hired) where projects are provided by industry.

Note: the courses have a lot in common for the first 2 years. It is therefore possible to change to another degree in the Department at the end of year 2 (provided that a 60% average is achieved for MEng degrees).

Year 3

In year 3 there is an increased use of other types of teaching as compared to the traditional lectures. The intent here is to give high-level knowledge in major areas of materials science and technology.

Core Modules — 70/120 credits

The main areas addressed in detail in the 3rd year are surface degradation by corrosion and wear and treatments to protect against these, engineering alloys and modern manufacturing methods. There is also training in performing Finite Element Modelling, and an introductory module on finance and law.

Other parts of the course — 50/120 credits

Some significant other parts of the course allow a wider range of experience to be developed in this year.

Industrial Training Program: students will gain a deep appreciation of 2 major industrial sectors for materials in the UK by interacting with 2 different companies, learning about their technical areas and ways of working, and carrying out a technical or research project based on their current needs.

Industrial Placement: Students will undertake a 5-6 month paid industrial placement, working on a technical project within industry, and producing a report that can be assessed as part of the degree.

Year 4

Core Modules — 25/120 credits

The final remaining core modules explore further advanced manufacturing topics, including quality control and optimisation methods used industrially, and metals processing.

Optional Modules — 30/120 credits

Optional modules are selected from materials modelling, glasses and cements, nuclear technology and waste management, nanomaterials, composites and materials for energy.

Other parts of the course — 65/120 credits

Industrial Training Program: Once again students will interact with an additional company, learning about their technical area and way of working, and carrying out a technical or research project based on their current needs.

Individual Research Project: Students will have the opportunity to select project areas of interest from across the research of the department, and then spend the entire academic year working on the project with one of the research groups.

The content of our courses is reviewed annually to make sure it's 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.

We aim to provide accurate and up-to-date information in all of our publications, but applicants should always refer to our website for the most up to date course information.

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