



The  
University  
Of  
Sheffield.

International  
College.



# Pre-Masters

Science and Engineering

*International  
students are  
made in  
Sheffield.*



# Science and Engineering

## Programme information

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Students enter the programme with a relevant first degree and study in English on a full-time basis for either 3 or 2 terms dependent on their language score on entry. The programme is designed to prepare students for Masters level study through a review of essential subject knowledge and its application in a UK academic context and development of appropriate English and academic skills.

On successful achievement of progression requirements, the University will be confident that graduates can embark and succeed on a range of Masters Degrees in the Sciences and in Engineering. A list of the approved progression Masters degrees can be found at:

[usic.sheffield.ac.uk/programmes/pre-masters/science-and-engineering](http://usic.sheffield.ac.uk/programmes/pre-masters/science-and-engineering)

This programme has been developed by Study Group in consultation with relevant University of Sheffield academic departments and professional services.

## Programme aims

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The overall aims of this programme are to:

- provide high quality learning opportunities to international students with a relevant first degree seeking a pathway to the Faculty of Science or Faculty of Engineering at The University of Sheffield for taught postgraduate degree provision;
- support development of students in transition to UKHE to enable them to achieve the required academic conditions for progression;
- enable students to progress with the appropriate level of knowledge and understanding, academic and language skills, confident and empowered to succeed on their degree programme in the medium of English;
- engender in students an awareness of their potential to contribute to the international academic community of the University.

## Pathways

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There is a choice of three pathways:

**Science and Engineering:** Leading to degrees in the Departments and Schools of Automatic Control and Systems Engineering, Chemistry, Chemical and Biological Engineering, Mechanical Engineering, Electronic and Electrical Engineering, Engineering, Mechanical Engineering, Physics and Psychology.

**Programming and Statistics:** Leading to degrees in Computer Science.

**Programming and Mathematics:** Leading to degrees in Computer Science.

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## Programme structure

### Modules common to all pathways:

- SE Critical Reading
- English Skills for University Study 2, 3 and 4 (ESUS)
- Computational Mathematics with MATLAB
- Literature Review and Journal Club
- Laboratory Skills and Experimental Design

An initial Personal Development Programme (**PDP**) module for 3-term students promotes students' reflective capacities, target setting and monitoring of own learning and development including time management and organisational skills. Subsequently, individual tutorials will be incorporated into *Laboratory Skills and Experimental Design* and *Literature Review and Journal Club*.

The more intensive pattern of delivery for 2-term students will require monitoring and support of a different type. Individual tutorials will be incorporated into *Laboratory Skills and Experimental Design* and *Literature Review and Journal Club* but, additionally, PMP SE students will be overseen by a named tutor.

Pathway-specific	Subject 1	Subject 2
Science and Engineering	Statistics for Research	Mathematics
Programming and Statistics	Statistics for Research	Programming
Programming and Mathematics	Mathematics	Programming

3 –term programme structure		
Term 1	Term 2	Term 3
ESUS 2	ESUS 3	ESUS 4
Computational Mathematics with MATLAB	Subject 1	
SE Critical Reading	Subject 2	
Maths Workshop	Literature Review and Journal Club	
PDP	Laboratory Skills and Experimental Design	

2-term programme structure	
Term 1	Term 2
ESUS 3	ESUS 4
Computational Mathematics with MATLAB	Subject 1
SE Critical Reading	Subject 2
Maths Workshop	
Literature Review and Journal Club	
Laboratory Skills and Experimental Design	



## Module descriptors

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### Core modules

#### Science and Engineering Critical Reading

The ability to read critically is an essential academic skill in UK higher education. The capacity to read critically facilitates good self-critical writing. In this module, students will build their critical skills familiarising themselves as they do so with the range of scientific academic texts they are likely to encounter later in their programme and at the University of Sheffield. Students will use authentic material in the University's libraries, learning how to select material, critically evaluate sources and synthesise their analyses in preparation for the literature review in *Literature Review and Journal Club*.

#### English Skills for University Study 2, 3 and 4 (ESUS)

The main aims of the ESUS modules are to provide a thorough training in the skills and communication patterns that enable international students to best achieve their academic potential both at the International College and on progression to their degree programme. ESUS modules are designed to support development beyond the minimum Home Office Tier 4 visa requirements for progression to UK Higher Education. They are designed to support students to meet the English language progression requirements for The University of Sheffield. English language skills are developed in the context of their use for academic study.

#### Computational Mathematics with MATLAB

Students will develop a robust knowledge and understanding of mathematical and computational concepts to enable them to investigate problems using the most appropriate analytical, numerical and computational techniques. They will acquire a good working knowledge of Excel and the mathematical software package MATLAB for data analysis, visualisation and modelling to solve mathematical problems.

#### Mathematics workshop (for students taking Mathematics)

This workshop is intended to serve as a diagnostic and revision opportunity to prepare students, by establishing the requisite level of knowledge and understanding, to progress to Mathematics. Students will identify and apply mathematical methods, tools and notations in the analysis of mathematical problems, demonstrating subject-based and technical vocabulary for studying mathematics in the medium of English. They will be expected to define the key terms precisely, and draw clear and reasonable conclusions.

#### Literature Review and Journal Club

This module prepares students for scholarly study and research at postgraduate level. It prepares students in a very practical way to undertake a literature review in the subject area of their Major. It is an opportunity for experience of extended reading and writing to demonstrate an appropriate level of synthesis through a literature review and speaking skills through presentation of journal articles or texts that are contributing to their literature review through the 'Journal Club'.

#### Laboratory Skills and Experimental Design

This module is primarily for Science and Engineering students and prepares them to work safely in the laboratory and to make appropriate choices in the selection of apparatus and procedures. Students will also learn the importance of maintaining a log book from which to prepare laboratory reports in accurate and appropriate written language and visual representations of data. Emphasis will be given not only to the analysis of data, but to the recognition that factors impact on the accuracy and reliability of results and thereby potential error. Students will develop their research design and re-design skills.



### **Personal Development Programme (PDP)**

Personal Development Portfolios are the norm for many professions in science and engineering and with the guidance and support of a personal Academic Adviser, this module enables students to become reflective, independent learners, able to identify their strengths and areas for improvement and to take action to ameliorate these. Students will monitor their own development and achievements, overseen by their Academic Adviser, so that they take responsibility for their learning and their achievements. For Masters level students, recognising the importance of autonomous independent learning is critical.

### **Pathway Specific modules**

#### **Mathematics**

Students will develop their knowledge of mathematical tools and further develop their skills in mathematical modelling. They will apply these to complex real-world problems working with case studies drawn from a range of engineering and scientific applications.

#### **Statistics for Research**

Students will explore the role that statistics play in solving scientific problems in a variety of contexts. They will learn how variability affects real-life data and impacts decision making. Through practical exercises, students will gain experience of organising and interpreting data and develop their ability to analyse and manipulate data. Choosing and using a variety of appropriate statistical tools for the problem in hand, they will also learn about the importance of assuring the quality of their datasets.

#### **Programming**

Students will develop their knowledge and understanding of the key elements of computer programming. They will select and apply appropriate program planning techniques in the design of elementary computer algorithms and develop algorithms to solve simple application problems. Practical work will engage students in producing simple Java applications and a clear logical set of imperative instructions. They will test, validate and document their solutions.

**For admissions enquiries:**

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F +44 (0)1273 339334

**Or enquire online at:**

[sheffield.ac.uk/international-college](http://sheffield.ac.uk/international-college)



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