Programme Specification

A statement of the knowledge, understanding and skills that underpin a taught programme of study leading to an award from The University of Sheffield

4	**Programme Title**	Foundation Year – Engineering Materials
4	**Programme Code**	MATU99
4	**JACS Code**	J501
4	**Level of Study**	Undergraduate – level 0
5a	**Final Qualification**	None – progression to level 1
5b	**QAA FHEQ Level**	Level 3
6	**Intermediate Qualification(s)**	None
7	**Teaching Institution** (if not Sheffield)	Not applicable
8	**Faculty**	Engineering
9	**Co-ordinating Department**	Interdisciplinary Programmes Engineering
10	**Other Department(s) involved in teaching the programme**	Applied Mathematics Physics & Astronomy, Chemical Engineering
11	**Mode(s) of Attendance**	Full-time
12	**Duration of the Programme**	1 year
13	**Accrediting Professional or Statutory Body**	Not applicable
14	**Date of production/revision**	September 2021

15. Background to the programme and subject area

The Foundation year is open to potential students in Engineering subjects, Maths, Physics and Chemistry. The content of the course is currently 33% Mathematics, 17% Physics, 17% Chemistry and 33% Introduction to Engineering (Labs and project work). Students have to state at application stage which Engineering Undergraduate course they will take in 1st year if they pass Foundation year. Some students have changed course but this is dependent on the receiving department having capacity.

The main aim of the year is to bring the students academically up to the A level entry requirements, for their department, in maths and sciences, whilst introducing them to concepts in engineering, such as team work, communications, project management and presenting information, whilst gaining relevant technical knowledge in their field.

These programmes are only suitable as progression routes onto an undergraduate course at this university.

Further information about the programmes may be found on the internet at http://www.sheffield.ac.uk/sefy

16. Programme Aims

The aims of the programmes are to:

1. enable students to develop a thorough knowledge and understanding of the elements of maths, physics, chemistry as required of an equivalent A level entry student.
2. provide students with an educational base which will in part satisfy the ability to progress to an undergraduate degree in engineering.
3. give students the opportunity to study particular aspects of engineering in depth, according to their interests.

4. encourage in students independence of thought and a critical approach to the interpretation of experimental evidence and to the evaluation of existing information.
5. foster in students the necessary skills needed to be a successful undergraduate.
6. help students develop a range of generic presentational and interpersonal skills appropriate to employment in the engineering sector and elsewhere.

17. Programme learning outcomes

Knowledge and understanding: By completion of the year, students will have knowledge and understanding of the:	
K1	Mathematics comparable to A-level mathematics.
K2	Physics & Chemistry comparable to AS-level Physics & Chemistry.
K3	Group Project work - be able to plan and perform a literature search, relevant to a specified area of study, as a group activity, and present information as a poster and oral presentation.
K4	Individual essay - be able to research from a variety of sources and correctly reference and cite this research; collect, collate and analyse the research and present the information in a defined format; draw conclusions from the research , and present using appropriate technical language.
K5	Understand the process of scientific investigation through practical work.

Skills and other attributes

Intellectual skills: By completion, students will be able to:	
I1	Select the appropriate formula and be able to solve a range of mathematical problems.
I2	Have a basic understanding of dynamics, materials and energy Physics.
I3	Have a wider understanding of the interdisciplinary roles of engineers
I4	Interpret the results of experimental investigations.

Practical skills: By completion, students will be able to:	
P1	Demonstrate and describe ethical, safe and skilful practical techniques.
P2	Process and select appropriate qualitative and quantitative methods.
P3	Make, record and communicate reliable and valid observations.
P4	Make measurements with appropriate precision and accuracy.
P5	Analyse, interpret, explain and evaluate the methodology, results and impact of their own and others experimental and investigative activities in a variety of ways.

Transferable skills: By completion students will have experience of:	
T1	Writing reports and delivering oral presentations in a style appropriate for the audience.
T2	Working as part of a team to produce an outcome.
T3	Working independently on a research essay.
T4	Planning simple projects and managing time effectively.

18. Teaching, learning and assessment

Development of the learning outcomes is promoted through the following teaching and learning methods:

- **Lectures:** used to transmit information, explain theories and concepts, and illustrate methods of analysis or design. For most lecture courses tutorial sheets are provided to enable students to develop their understanding during private study.
- **Practical classes:** working in groups of two or three, students undertake laboratory experiments to gain practical skills. Labs will have guidance sheets explaining the experiment and aims, and will require students to collect data, graph, calculate parameters and write valid conclusions.
- **Personal tutorials:** run for small groups of six or less to discuss both technical and transferable skill based material. Students are encouraged to take an active part in discussions. These tutorials will also facilitate transfer of specific technical knowledge regarding home department activities, required for the group and individual projects.
- **Problem classes:** run for the whole class to help students to resolve difficulties as they work through the problem sheets.
- **Group project:** a major study carried out over semester 1, involving the creation of a poster based on a topic agreed with the student's home department. It is supervised by a member of the academic staff and allows the students to display initiative, originality and creativity. Students will defend their work in a group assessed day and academic judging panel.
- **Individual essay project:** a major study carried out over semester 2, involving the creation of a 3000 word essay, the topic chosen in negotiation with the home department. It is supervised by a member of the academic staff and allows the student to develop specific technical knowledge relevant to their future field of study. The work must comply with a recognised written format including correct referencing.

Opportunities to demonstrate achievement of the learning outcomes are provided through the following assessment methods:

- **Written examinations -** examinations of up to three hours duration.
- **Coursework submissions** - these include formal laboratory reports, group report presentation and poster, individual essay and tutorial assignments.
- **Oral presentations** - oral presentation is used as one of the methods of assessment of the group project, each member of the group is expected to take part in the presentation.
- **Individual project reports** - written reports prepared individually.

The main teaching, learning and assessment methods adopted for each learning outcome are shown below. In most cases a combination of methods is used.

Learning Outcome (in abbreviated form – see section 17 for the full text)	Teaching / Learning						Assessment			
	Lectures	Practical classes	Coursework	Tutorials / example	Individual design		Written	Coursework	Oral presentations	Individual project
K1 Maths	ξ	ξ	ξ	ξ			ξ	ξ		
K2 Physics & Chemistry	ξ	ξ	ξ	ξ			ξ	ξ		
K3 Group project	ξ			ξ	ξ		ξ	ξ	ξ	
K4 Individual essay	ξ			ξ	ξ			ξ		ξ
K5 Scientific Investigation		ξ		ξ				ξ		
I1 Selecting mathematical formula and use		ξ	ξ	ξ			ξ	ξ		
I2 Knowledge – elements of physics & chemistry		ξ	ξ	ξ			ξ	ξ		
I3 Engineering skills in context	ξ			ξ	ξ			ξ	ξ	ξ
I4 Understanding experimental outcomes		ξ	ξ	ξ				ξ		
P1 Safe working practices		ξ	ξ	ξ				ξ		
P2 Qualitative and Quantitative methods		ξ	ξ	ξ				ξ		
P3 Accurately record data		ξ	ξ	ξ				ξ		
P4 Use a range of measuring equipment		ξ	ξ	ξ				ξ		
P5 Analyse practical outcomes		ξ	ξ	ξ				ξ		
T1 Presentation skills	ξ		ξ	ξ	ξ			ξ	ξ	ξ
T2 Teamwork	ξ	ξ	ξ		ξ			ξ	ξ	
T3 Independent working			ξ	ξ	ξ			ξ	ξ	ξ

T4 Project / time management	ξ	ξ	ξ		ξ			ξ		ξ

Proportions of types of assessment by level can be found on the UniStats website: http://discoveruni.gov.uk/

19. Reference points

The learning outcomes have been developed to reflect the following points of reference:

Subject Benchmark Statements
https://www.qaa.ac.uk/quality-code/subject-benchmark-statements

Framework for Higher Education Qualifications (2014)
https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf

University Strategic Plan
https://www.sheffield.ac.uk/vision

Learning and Teaching Strategy (2016-21)
https://www.sheffield.ac.uk/polopoly_fs/1.661828!/file/FinalStrategy.pdf

UK-SPEC, Engineering Council, 2020
https://www.engc.org.uk/standards-guidance/standards/uk-spec/

20. Programme structure and regulations

The structure of these programmes is modular and worth a total of 120 credits. The student enrols on a Foundation year in MEng Engineering. The credit structure is appropriate for going on to study MEng or BEng Engineering. It is possible for a student to change their choice of degree pathway, but only with the agreement of the admissions tutor in the receiving department, and is in no way guaranteed. Successful completion of the 120 credits at 60% or above guarantees the student a place at level 1 in their original department which they applied for only.

With the benefit of more detailed knowledge of the degree options available, generally at the end of UG year 2 students must choose one of the MEng programmes run by the Department. A student's initial application in no way constrains this choice, but changes between and within BEng and MEng programmes, and vice versa, are not generally permitted after the beginning of Year 3. Students must satisfy the appropriate progression criteria in order to proceed to Year 3 of an MEng programme; those who do not will be required to join the third year of the BEng programme for this course.

Detailed information about the structure of programmes, regulations concerning assessment and progression and descriptions of individual modules are published in the University Calendar available on-line at http://www.sheffield.ac.uk/calendar/regs.

21. Student development over the course of study

On successful completion of the programme (>=60%) - Students will be automatically accepted onto the original degree course applied for on an undergraduate level 1 programme. Transfer to any other degree course is only possible with the agreement of the receiving department and is not guaranteed.

22. Criteria for admission to the programme

Detailed information regarding admission to the programme is available at http://www.shef.ac.uk/prospective/

23. Additional information

The foundation course is run in collaboration with the Faculty of Science and lectures are jointly attended by students on Foundation Year Physics. Further information about all the programmes and the departments can be found on-line at http://www.shef.ac.uk/sefy
This specification represents a concise statement about the main features of the programme and should be considered alongside other sources of information provided by the teaching department(s) and the University. In addition to programme specific information, further information about studying at The University of Sheffield can be accessed via our Student Services web site at http://www.shef.ac.uk/ssid.