The University Of Sheffield.

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

Programme Details

1. Programme title	Electronic and Electrical Engineering
2. Programme code	EEET13
3. QAA FHEQ level	7
4. Faculty	Engineering
5. Department	Electronic and Electrical Engineering
6. Other departments providing credit bearing modules for the programme	Not applicable
7. Accrediting Professional or Statutory Body	The Institution of Engineering and Technology
8. Date of production/revision	December 2022

Awards	Type of award	Duration
9. Final award	MSc	1 year
10. Intermediate awards	PG Diploma	1 year
	PG Certificate	1 year

Programme Codes

11. JACS code(s) *Select between one and three codes from the HESA website.*	H600		
12. HECoS code(s) *Select between one and three codes from the HECoS vocabulary.*	100163		

Programme Delivery

13. Mode of study	Full-time
14. Mode of delivery	In-person

15. Background to the programme and subject area

Electronic and electrical engineering is a broad and rapidly expanding set of disciplines. Building on core teaching in electrical machines, electronic materials, and the way that electronic circuits interact, this course will allow you to choose from a wide range of optional modules from all our active research areas to tailor your learning in a way that meets with your requirements.

The Electronic and Electrical Engineering Department at Sheffield has been one of the UK's leading EEE Departments for several decades with internationally leading excellence in research. The modules comprising this programme are delivered by expert academic staff who are active at the forefront of research in many aspects of electronic and electrical engineering, such as development of high performance nanostructure electronic devices, design of high performance motors and drive electronics, development of next-generation communication and radar systems, and the design and systems incorporation of novel integrated circuits, and have strong links with partners in industry.

This programme will provide students with an opportunity to further their knowledge of electronic and electrical engineering, while potentially specialising in a specific field of the subject, enabling them to pursue a particular direction in either their chosen career or further study. It has been "accredited" by the Institute of Engineering and Technology as a package of further learning which, when combined with an appropriate accredited BEng(Hons) degree of at least a 2.2 or better, will satisfy the educational requirements for becoming a Chartered Engineer. It is delivered with a bias towards research and development and we expect most graduates from this programme either to gain employment in the R & D commercial/industrial sector or to embark on further studies leading to a PhD, either at Sheffield or elsewhere.

Further information about the programmes may be found on the internet at https://www.sheffield.ac.uk/eee/postgraduate/courses

16. Programme aims

MSc Electronic and Electrical Engineering aims to:	
A1	provide access to a Masters level degree course in electronic and electrical engineering to graduates or professionals from a variety of backgrounds.
A2	provide students with "accredited" further learning which together with an appropriate BEng(Hons) degree will satisfy the educational base needed to become a Chartered Engineer.
A3	foster in students a commitment to self-improvement and continuing professional development.
A4	provide students with a detailed knowledge and understanding of the rapidly developing field of electronic engineering.
A5	give students the opportunity to study particular aspects of electronic and electrical engineering in depth, according to their interests.
A6	provide teaching that is underpinned by the research attainment and scholarship of the staff.
A7	prepare students for a professional career in the electronic engineering research and development sector.

17. Programme learning outcomes

Knowledge and understanding On successful completion of the programme, students will be able to demonstrate knowledge and understanding of:		
		Links to Aim(s)
K1	the principles of electronic and electrical engineering, with in-depth knowledge in those areas selected by the student.	A1, A2, A4
K2	advanced analytical methods relevant to electronic and electrical engineering.	A4
K3	the state-of-the-art developments in the field in the areas of specialisation selected.	A4, A5, A6
K4	the research methods and scientific techniques relevant to electronic and electrical engineering.	A3
K5	the area of their individual research topic.	A5
Skills and other attributes On successful completion of the programme, students will be able to:		
S1	gather, organise and critically evaluate information needed to formulate and solve problems.	A5
S2	apply acquired knowledge effectively and efficiently in any electronic and electrical engineering application.	A4, A5
S3	produce verbal and written communications appropriate for the presentation of technical information.	A7
S4	work independently, and as a group, on technical problems.	A5, A7
S5	manage time effectively.	A7
S6	plan and execute a major research based investigation.	A7
S7	engage with personal and professional development.	A2

18. Learning and teaching methods

Development of the programme 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 design.
- **Coursework assignments –** generally require students to seek additional information and work on their own, or sometimes in small groups, to develop understanding of subject matter.
- **Problem Sheets –** to assist students with their understanding and to resolve specific problems.
- **Formative quizzes –** to provide regular evaluation of basic competency in modules.
- **Dissertation –** a major individual research study supervised by a member of academic staff and possibly a partner from industry, allows the student ample scope to display initiative, originality

and creativity.

19. Assessment and feedback methods

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

- **Examinations** – usually of two/three hours duration consisting of competency based, threshold questions, and one/two more challenging questions to allow students to demonstrate depth of understanding.
- **Coursework submissions** – these include design studies, computational assignments and research reports.
- **Oral presentations**– students present their research work to their supervisors and peer group.
- **Group design work**–students will work in teams to tackle engineering problems and present their findings.
- **Individual project reports** - interim and detailed final reports are written describing the research work.

Opportunities for feedback are provided using the following methods:

- **Formative quizzes** – Quizzes will be provided so allow students to check their basic competency.
- **Project supervision** – During the individual research project students will be given verbal feedback during regular project meetings.
- **Discussion with subject experts** – students are encouraged to ask questions of our subject experts during teaching sessions to gain feedback on problems faced and develop student learning.

20. Programme structure and student development

Taught modules - Upon successful completion of the taught modules, students from across the range of different backgrounds will have developed a thorough understanding of the fundamental principles underlying electronic engineering and acquired some knowledge in the chosen specialised modules. Most modules introduce advanced specialist knowledge designed to further enhance students' understanding and ability, and also to broaden their knowledge more generally. By the end of the second semester, students will be familiar with state-of-the-art electronic engineering with particular reference to those areas specialised in. They will be able to assimilate and process advanced engineering concepts and present these orally and in writing to a variety of audiences.

Group design project - Students will work in small groups to tackle engineering problems set in a global context. The project aims to enhance design, project management, communication, and group working skills, which aim to help to develop student employability and professional development.

Research project - On successful completion of the research project, MSc students will, in addition, have developed their skills in research methods, time management and project management and will display initiative and imagination in their acquisition of frontier knowledge and in their approach to problem solving.

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

21. Criteria for admission to the programme

Most students enter with UK degree level qualifications of at least lower second, although preferably upper second or first class standard or with equivalent qualifications from overseas. Those with industrial experience are considered on an individual basis. Applications are welcome from graduates of most of the disciplines that involve a high degree of mathematical competence. Typically students are expected to have degrees in an Electronic or related subject, or from backgrounds including Physics. Other branches of Engineering, Mathematics and Computer Science Students with these backgrounds will be considered carefully. In general those with a non-electronics background will be required to have a higher degree qualification in order to be admitted. General University requirements regarding English qualifications must also be satisfied.

Detailed information regarding admission to programmes is available from the University's On-Line Prospectus at http://www.shef.ac.uk/courses/. Specific details about the courses we offer in the departments can be found at https://www.sheffield.ac.uk/eee/postgraduate/courses.

22. 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
http://www.sheffield.ac.uk/strategicplan

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

23. Additional information

The high admissions requirement reflects our desire to attract only the best students, who will benefit the most from our top rated research and our good quality teaching. From our existing MSc, a significant number of MSc graduates remain with us to subsequently study for PhDs.

The Electronic and Electrical Engineering department has extensive semiconductor clean room facilities, which enables students to undertake semiconductor device fabrication projects. The Electrical Machines and Drives research group has extensive industrial contacts with automotive, aerospace and power control industries. State of the art facilities such as lamination cutting, magnetising rigs for creating unique permanent magnet geometries, computer controlled dynamometers and extensive magnetic circuit and power electronic computer modelling facilities are available to students who take on projects in this area. The Communications research group has wide contact with the aerospace and mobile communications industries and is equipped with state of the art network analysis and antenna test facilities, the latter including anechoic chambers. These facilities can be used by project students undertaking projects in the communications area.

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.