University of Sheffield

Programme Specification

This specification provides a summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided.

The content of our courses is reviewed annually to make sure it's up-to-date and relevant. Individual modules are occasionally updated or withdrawn. 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. In the event of any change we will inform students and take reasonable steps to minimise disruption.

Programme Details

1. Programme title	Digital Manufacturing Engineering		
2. Award type	Master of Science		
3. Programme details	**FHEQ Level:** 7	**Mode of Study:** Full time	**Duration:** 1 year
4. Faculty	Faculty of Engineering		
5. School	**Owning:** School of Mechanical, Aerospace and Civil Engineering **Shared with:** School of Electrical and Electronic Engineering, School of Chemical, Materials and Biological Engineering		
6. Accrediting Professional or Statutory Body	Institution of Mechanical Engineers (IMechE)		
7. HECoS code *Select between one and three codes from the HECoS vocabulary.*	**Code:** 100202 **Percentage:** 50	**Code:** 100209 **Percentage:** 50	**Code:** **Percentage:**
Programme code(s) (internal use)	MACT010		

9. Programme aims

The programme aims to:	
A1	Instil an independence of thought, intellectual curiosity and critical approach to evidence, theories and concepts around digital manufacturing.
A2	Provide advanced understanding and critical knowledge in selected areas of manufacturing engineering appropriate to the programme.
A3	Provide experience in a substantial research/development project appropriate to the programme and prepare students for a career in manufacturing engineering.
A4	Provide opportunities for students to become skilled in technical tools and practical techniques appropriate to their career direction and interests, and the professional skills needed for working effectively in a professional engineering environment.
A5	Develop a range of transferable lifetime skills that help students to maximise their potential in all aspects of their course.

10. Programme learning outcomes

Knowledge and understanding (K) On successful completion of the programme, students will be able to demonstrate knowledge and understanding of:	
K1	Advanced knowledge and understanding of the concepts, theories and principles in areas of digital manufacturing engineering appropriate to the programme.
K2	An understanding of how advanced analytical methods are used in digital manufacturing engineering appropriate to the programme.
K3	Critical knowledge of areas of digital manufacturing engineering appropriate to the programme.
K4	A broad understanding of approaches to research in digital manufacturing engineering.
K5	A broad understanding of the social, environmental, and commercial context within which digital manufacturing is undertaken.
Skills and other attributes (S) *When considering the skills and attributes developed in this programme, please refer to the Sheffield Graduate attributes (SGAs). SGAs can be found here* On successful completion of the programme, students will be able to:	
S1	Demonstrate skills in the acquisition, use and critical evaluation of subject-related information.
S2	Use engineering science, mathematics and information technology to analyse and solve engineering problems.
S3	Conduct a research/development project, taking account of technical, environmental, ethical, and commercial considerations.
S4	Deploy creativity, innovation and design techniques in solving unfamiliar problems and fulfilling new needs.

S5	Communicate at a professional level, orally and in writing, while working effectively in collaboration with others.
S6	Exercise independent thought and judgement.
S7	Describe their own strengths and weaknesses and use this to engage with their own development.
S8	Use simple project and workload management tools to develop a systematic approach to structuring and tracking work and manage successful completion.

11. Learning and teaching methods *(this should include a summary of methods used throughout the programme, including any unique features and should be written with a student focus as this information will display to current students and applicants i.e. prospectus)*

Lectures: These are principal means of transmitting academic material and analysis techniques. Most lecture courses provide tutorial sheets or similar to enable students to develop their understanding during private study.

Tutorials (and Example Classes): These support students to resolve problems in their understanding of course material with students in appropriate group sizes (from small-groups to full-class).

Practical Activities: These typically take the form of laboratory or workshop classes. Laboratory classes introduce experimental methods and provide an opportunity for students to observe phenomena taught elsewhere in the curriculum, supporting their understanding. They also provide a good opportunity to develop collaboration and communication skills.

Online Resources: These resources can be the primary method of delivery, or as a 'capture' that offers students the opportunity to revisit topics. They might be dedicated resources developed by academic staff and made available to students through the Virtual Learning Environment (VLE) or a set of carefully curated pre-existing resources (e.g. from the wide range of online expert learning providers that are publicly available or part of the University's subscriptions) that the students are signposted towards. This format builds digital literacy, supports self-paced learning and helps facilitate a more diverse, and therefore inclusive, learning environment.

Design Problems: *These problems support students to integrate and develop their knowledge and understanding, intellectual capabilities and practical skills in order to address typical manufacturing engineering problems that are "open-ended" and often ill-defined.*

Coursework Assignments (including Oral, Video and Poster Presentations): A number of modules might have coursework assignments that require students to seek additional information and work on their own, or sometimes in small groups. They are designed to enable students to develop and show their understanding of the content of the module. Oral, video or and poster presentations are occasionally included as part of coursework assignments to provide opportunities for developing essential communication skills.

Individual Project: This individual research / development project, provides students with an opportunity to demonstrate, and experiment with, the knowledge, understanding and skills they have developed throughout the programme and supports them to further develop their project-management, and communication skills. This project is usually performed under the supervision of an academic member of staff and it brings together the manufacturing and digital elements of the programme.

12. Assessment and feedback methods *(this should include the range of types of methods used and should be written with a student focus as this information will display to current students and applicants i.e. prospectus)*

Written Examinations: Exams are typically 1 - 3 hours in duration, depending on module size and the presence of complementary assessment methods. Some modules use examinations as the only assessment method.

Coursework Assignments (including a selection or all of Oral, Video and Poster Presentations): Coursework assignments are used in some modules, computational work, laboratory reports, essays or other work designed to assess the understanding of the module. Some assignments might use oral, video and/or poster presentations to assess the development of presentation and communication skills. Some modules use coursework assignments as the only method of assessment whilst others have complementary assessments such as a written examination.

Class Test: These are small tests conducted during the main teaching periods to assess progress and understanding. They provide the module leader with a general overview of student progress and allow individual students to gauge their own progress.

Individual Project: This substantial project is assessed via a written thesis, a viva voce to a panel of academic staff and the response to questions from the panel. All assignments are expected to be completed to a professional standard.

Feedback

Feedback to students will be given on a regular basis throughout the Programme. It will provide encouragement and will offer suggestions for improvement. Students will be expected to use feedback from staff to improve the quality of their work and enhance their personal development. The feedback can be summative (e.g. written comments on assignments) or formative (e.g. verbally during lectures, tutorials, laboratory, and other teaching and learning sessions).

Feedback from students and the industry sponsors/employers is actively sought in order to monitor the operational delivery of the programme against its educational aims and objectives, as well as industry requirements, and thus assist staff to strive for continuous improvement.

Version Number:	Purpose / Change:	Cohort affected: (academic year and level)	Date change approved:
1	New Programme	26/27	June 2025

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