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	Engineering Manufacturing Technician
2. Programme code	AMRU25
3. QAA FHEQ level	4
4. Faculty	Engineering
5. Department	AMRC
6. Other departments providing credit bearing modules for the programme	Management School
7. Accrediting Professional or Statutory Body	Not applicable
8. Date of production/revision	June 2020

Awards	Type of award	Duration
9. Final award	Apprenticeship	3 years
10. Intermediate awards		

Programme Codes

11. JACS code(s) *Select between one and three codes from the HESA website.*	H700		
12. HECoS code(s) *Select between one and three codes from the HECoS vocabulary.*	100209		

Programme Delivery

13. Mode of study	Full-time

14. Mode of delivery	Face-to-face, blended learning and workplace assessment

15. Background to the programme and subject area

The Engineering Manufacturing Technician is L4 apprenticeship, the purpose of which is to train technicians to gather information and data from a range of sources, analyse this information/data in order to make decisions, solve problems and produce and/or update technical documentation, reports or specifications in areas such as quality, reliability, production schedules/targets, costing or other technical documentation to inform others on decision making such as how a product must be designed, manufactured, tested, modified, maintained, stored, transported, commissioned or decommissioned.

An employee in this occupation will be responsible for the quality, safety and delivery of the manufactured product or service, ensuring it is delivered to the customer on time at the agreed cost. They will typically report to an engineering or manufacturing manager as part of a cross functional team, the size of this team and responsibilities will vary depending on the size of the employer. Although working within defined quality processes and procedures, they are responsible for the delivery, quality and accuracy of the work they complete. They have the autonomy to use judgement when undertaking the occupational duties and applying their technical knowledge, skills and behaviours in a wide range of contexts and environments. They use a range of tools and techniques to support decision making and solve problems that are often complex and non-routine. They also have a responsibility to identify and contribute to making improvements such as business processes, procedures, ways and methods of working.

https://www.instituteforapprenticeships.org/apprenticeship-standards/engineering-manufacturing-technician/

This apprenticeship compliments the AMRC-TC's current offer by providing a progression route for Engineering Technicians who are ready to develop the knowledge, skills and behaviours required of an Engineering Manufacturing Technician.

16. Programme aims

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	Problem solving tools/techniques. Such as practical problem solving (PPS), root cause analysis (RCA) and process failure mode effects analysis (PFMEA).	
K2	Effective communication techniques including listening, questioning and support of others.	
K3	Use, benefits and applications of lean methods and tools used in manufacturing and engineering (such as Kaizen, Six Sigma and 8 wastes).	

K4	How Industry 4.0 will impact organisations, including the integration of automation, digital systems and manufacturing engineering systems.	
K5	Quality management systems used such as ISO9001, AS9100, ISO 14001 and TS16949, its purpose and internal governance arrangements to ensure compliance.	
K6	Different manufacturing methods used, their applications, such as machining, joining, forming, assembling, shaping, processing, printing, moulding, extruding and casting.	
K7	Principles of quality control and quality assurance in a manufacturing and engineering environment.	
K8	Team integration techniques, including conflict resolution and managing difficult conversations (team working).	
K9	Core engineering principles such as mathematics, science, mechanical and electrical/electronic applications relevant to manufacturing and engineering activity undertaken.	
K10	Importance for individuals to use and follow the organisations approved Standard Operating Procedures (SOP's) and documentation recording systems and the potential implications on safety, quality and delivery if they are not adhered to.	
K11	Statutory and organisation health and safety policies, procedures and regulations that must be adhered to in a manufacturing and engineering environment including the risk assessment process, procedures and documentation used within the work area.	
K12	Project management techniques, such as Strengths, Weaknesses, Opportunities, Threats (SWOT), stakeholder matrices, risk mapping, radar chart and summary risk profiles.	
K13	How human factors (organisational, environment and job factors) can influence and impact individual characteristics, performance and behaviours in the workplace.	
K14	Engineering and manufacturing related documentation used such as job cards / build records, 2D & 3D drawing/models, Bill of Materials (BOM), Cost Analysis Reports, Compliance Report, Standard Operating Instructions (SOI's), Standard Process Instructions (POI's), Engineering Query Notifications (EQN's) and Drawing Query Notifications (DQN's).	
K15	Prioritisation of workload/time management techniques to ensure that personal and team objectives are achieved effectively.	
K16	Engineering and manufacturing data collection systems used, their format and content.	
K17	How organisations manage and monitor internal and or supplier performance to ensure that cost, quality, delivery and sustainability objectives are being delivered.	

K18	Use and applications of common metallic and non – metallic materials used in manufacturing and engineering.	
K19	Different production methods used and their applications such as single, batch, flow and mass.	
K20	Different methods, tools and frequency used to check quality in manufacturing and engineering including measurements such as (dimensions, weight, signal, temperature, time,) and testing (such as non-destructive and destructive).	
K21	Departmental process used to create, record and review financial data and information.	
K22	The different applications and limitations of computer based software system/packages used such as Computer Aided Design (CAD), Data Analytics and Databases.	
K23	The impact of sustainability and environmental efficiency and how such matters influence manufacturing decisions.	
Skills and other attributes On successful completion of the programme, students will be able to:		
S1	Read and extract relevant engineering and manufacturing related data and information (such as workplans/project plans ,schedules, drawings, specifications, production data, quality reports, costing data, statistical information) drawing accurate conclusions and making informed decision.s	
S2	Use project management tools, such as Strengths, Weaknesses, Opportunities, Threats (SWOT), stakeholder matrices, risk mapping, radar chart and summary risk profiles.	
S3	Use problem solving tools such as Root Cause Analysis (RCA) Process Failure Modes Effects Analysis (PFMEA), Fishbone, Practical Problem Solving (PPS) and Advanced Product Quality Planning (APQP).	
S4	Analyse and interpret data and information in order to generate manufacturing engineering documentation such as Parts Per Million (PPM) quality adherence, cost analysis and test data.	
S5	Communicate using the appropriate method for the audience such as, formal and informal presentations, written reports, verbal, electronic, social media and incorporating relevant and appropriate data and/or metrics.	
S6	Use the approved process and quality compliance procedure to create or amend engineering and/or manufacturing documentation.	
S7	Use lean tools and techniques, such as Six Sigma, 8 Wastes, Workplace organisation such as 5S's (sort, set in order, shine, standardise and sustain), Kaizen and Poka-Yoke (Error proofing).	
S8	Apply documentation control processes and procedures such as format, location, access, authorisation.	

S9	Use financial planning, recording and review processes and documentation such as departmental budgets, estimating, cost control, cost forecasting, and investment appraisal.	
S10	Use computer based software system/packages such as Computer Aided Design (CAD), Data Analytics and Databases.	
B1	Champion the importance of adherence to the organisation's Environmental, Health and Safety management systems:- actively displays and promotes a safety first culture within the organisation.	
B2	Operate in a systematic, proactive and transparent way.	
B3	Actively promotes the case for the adoption of emerging and advanced engineering and manufacturing technologies to optimise performance.	
B4	Take full responsibility for own professional development, seeking opportunities to enhance knowledge, skills and experience. Keeping abreast of developments in engineering processes manufacturing and emerging technologies.	
B5	Comply with statutory and organisational health & safety regulations and policies at all times. Accepts responsibility for their workload with a responsible approach to risk. Demonstrates a high level of motivation and resilience when facing challenge.	
B6	Create and maintains positive, professional, trusting and ethical working relationships with their team and the wider range of internal, external and connected stakeholders.	
B7	Act professionally with a positive and respectful attitude.	

18. Learning and teaching methods

Blended learning will be used where appropriate, with instructional content provided for independent study time so that contact time can be used for exercises, problem cases and discussion. The instructional content will include a variety of pre-recorded lectures, quizzes, chapters from text books and other material.

Lectures will be pre-recorded for independent study or captured electronically; tutorials will be used to explore topics in more detail either through structured discussion or case studies; problem solving classes will provide time for students to identify specific problems, difficulties and solutions to develop their confidence and competence in problem solving. Students will be given more complex problems to solve in small groups or individually with staff support. Laboratory classes provide opportunities for students to practice and develop a range of discipline-based techniques, apply and investigate theoretical and conceptual knowledge, develop experimental techniques and approaches, analysing, interpreting and presenting their findings and data, developing personal and transferable skills such as problem solving, team working, following protocols and working safely.

Assessors will meet apprentices in the workplace to evidence the application of the knowledge, skills and behaviours in the workplace, and to ensure that apprentices are suitably prepared for End Point Assessment.

19. Assessment and feedback methods

A variety of assessments will be used to assess students formatively, from timed assessments, coursework, laboratory reports and presentations. Formative assessments, in the form of short quizzes, formative lab reports, phase tests and mock exams.

Students will be given feedback from short quizzes through Blackboard, phase tests, and lab reports. Students will also be supported and receive individual and group feedback in problem solving classes.

Students will develop a portfolio to demonstrate their achievement of the knowledge, skills and behaviours required by the Standard.

20. Programme structure and student development

The programme is made up of the HNC in Manufacturing Operations, practical sessions, as required in the workshop, and work based learning where students demonstrate the application of their learning in the workplace.

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

Distinction Merit, BTEC Diploma (120 credits), passing the Higher Maths Assessment. Three years experience as an Engineering Technician.

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

Institute for Apprenticeships and Technical Education

https://www.instituteforapprenticeships.org/apprenticeship-standards/engineering-manufacturing-technician/

23. Additional information

This programme is available for apprentices on the Engineering Manufacturing Technician apprenticeship standard.

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.