

Course Specification

Course	Course Summary Information			
1	Course Titles	Manufacturing Engineer (Degree) (ST0025) Apprenticeship		
2	BCU Course Codes	US1017/ US1019 US1021/US1023		
3	Awarding Institution	Birmingham City University		
4	Teaching Institution(s) (if different from point 3)			
5	Professional Statutory or Regulatory Body (PSRB) accreditation (if applicable)			

6	Course Description
	The skills shortages in the engineering sector has been recognised by the government, and a report published by the Royal Academy of Engineering in 2016 has reported that the UK will have a shortage of more than one million engineers/technicians by the year 2020 unless action is take. Ongoing updates from the government publications continue to show the need for professionally accredited engineers which the proposed degree apprenticeships will address.
	This degree apprenticeship is fully informed and supported by industry practice and recognised research in design and delivery of modules by experienced staff who have extensive industry experience.
	The curriculum is practice led and cultivates problem solving skills, improving communication through effective real-life project work, work experience, and cases. Team working on real life scenarios develop professional competence and prepares you for further employment opportunities and career development.
	Manufacturing engineering is an essential feature in the vast arena of manufacturing – an area that makes large contributions to the wealth of many countries throughout Europe and the rest of the world. It is a fast-changing scene where the competition between industrial organisations is keen and lean: only those companies prepared to apply modern philosophies and technologies will survive.
	This degree apprenticeship has been developed to provide you with a good knowledge of a range of manufacturing principles. It will prepare you for the rapidly developing field of manufacturing engineering and its supporting operational systems. Upon your completion you will have the intellectual, creative and personal qualities necessary for undertaking a leadership role and a depth of knowledge that will enable the application of new and emerging technologies to the solution of manufacturing problems.
	This degree apprenticeship in manufacturing engineer aims to develop engineers who can apply the principles of systems management, engineering and information technology to the solution of operational problems in industry and commerce. Manufacturing engineers are employed in a wide range of engineering, educational and commercial organisations. You will be equipped with relevant skills to allow you to progress into positions of responsibility in relevant industry, or further postgraduate apprenticeships of specialised study or research.
	There are many challenges facing manufacturing industry. Companies now strive for competitive advantage and have to evaluate their performance more effectively in order to make best possible use of all resources: Talented, innovative, ambitious engineers are needed to give manufacturing organisations a competitive edge.

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7	Course Awards		
7a	Final Awards for the Degree Apprenticeship Manufacturing EngineerLevelCredits Awarded		
	Bachelor of Engineering with Honours Manufacturing Engineering6360		
7b	Exit Awards and Credits Awarded		
	Certificate of Higher Education Manufacturing Engineering Diploma of Higher Education Manufacturing Engineering Bachelor of Engineering Manufacturing Engineering	4 5 6	120 240 300

8	Derogations from the University Regulations	
	1. For modules with more than one item of assessment, apprentices must achieve a minimum of 30% in each item of assessment in order to pass the module	
	2. Compensation of marginal failure in up to 20 credits is permitted at each level	
	3. Condonement of failed modules is not permitted	

9	Delivery Patterns			
Mode(s) of Study		Location	Duration of Study	Code
BEng (Hons) Part Time		City Centre	5 years	USxxxx

10 Entry Requirements

The admission requirements for this degree apprenticeship are stated on the course page of the BCU website at <u>https://www.bcu.ac.uk/</u> or may be found by searching for the course entry profile located on the UCAS website.



11	Course Learning Outcomes			
Science and Mathematics (SM)				
SM1i	Knowledge and understanding of the scientific principles underpinning relevant technologies, and their evolution			
SM2i	Knowledge and understanding of mathematics and an awareness of statistical methods necessary to support application of key engineering principles			
SM1b	Knowledge and understanding of scientific principles and methodology necessary to underpin their education in Manufacturing engineering, to enable appreciation of its scientific and engineering context, and to support their understanding of relevant historical, current and future developments and technologies			
SM2b	Knowledge and understanding of mathematical and statistical methods necessary to underpin their education in Manufacturing engineering and to enable them to apply mathematical and statistical methods, tools and notations proficiently in the analysis and solution of engineering problems			
SM3b	Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of their Manufacturing engineering discipline			
	Engineering Analysis (EA)			
EA1i	Ability to monitor, interpret and apply the results of analysis and modelling in order to bring about continuous improvement			
EA2i	Ability to apply quantitative methods in order to understand the performance of systems and components			
EA3i	Ability to use the results of engineering analysis to solve engineering problems and to recommend appropriate action			
EA4i	Ability to apply an integrated or systems approach to engineering problems through know- how of the relevant technologies and their application			
EA1b	Inderstanding of engineering principles and the ability to apply them to analyse key			
EA2	Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques			
EA3b	Ability to apply quantitative and computational methods in order to solve engineering problems and to implement appropriate action			
EA4b	Understanding of, and the ability to apply, an integrated or systems approach to solving engineering problems			
	Design (D)			
D1i	Be aware of business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics			
D2i	Define the problem identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards			
D3	Work with information that may be incomplete or uncertain and be aware that this may affect the design			
D4i	Apply problem-solving skills, technical knowledge and understanding to create or adapt designs solutions that are fit for purpose including operation, maintenance, reliability etc.			
D5i	Manage the design process, including cost drivers, and evaluate outcomes			
D6	Communicate their work to technical and non-technical audiences			
D1	Understand and evaluate business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics			

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D2	Investigate and define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property;				
	codes of practice and standards.				
D3b	Work with information that may be incomplete or uncertain and quantify the effect of this on the design				
D4	Apply advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose for all aspects of the problem including production, operation, maintenance and disposal				
D5	Plan and manage the design process, including cost drivers, and evaluate outcomes				
	Economic, Legal, Social, Ethical and Environmental Context (EL)				
EL1	Understanding of the need for a high level of professional and ethical conduct in engineering and a knowledge of professional codes of conduct				
EL2	Knowledge and understanding of the commercial, economic and social context of engineering				
	processes				
EL3i	Knowledge of management techniques that may be used to achieve engineering objectives				
EL4i	Understanding of the requirement for engineering activities to promote sustainable development				
EL5	Awareness of the relevant legal requirements governing engineering activities, including personnel, health & safety, contracts, intellectual property rights, product safety and liability issues				
EL6i	Awareness of risk issues, including health & safety, environmental and commercial risk				
EL3	Knowledge and understanding of management techniques, including project management, that may be used to achieve engineering objectives				
EL4	Understanding of the requirement for engineering activities to promote sustainable development and ability to apply quantitative techniques where appropriate				
EL6	Knowledge and understanding of risk issues, including health and safety, environmental and commercial risk, and of risk assessment and risk management techniques				
	Engineering Practice (P)				
P1i	Knowledge of contexts in which engineering knowledge can be applied (e.g. operations and management, application and development of technology, etc.)				
P2i	Understanding of and ability to use relevant materials, equipment, tools, processes, or products				
P3i	Knowledge and understanding of workshop and laboratory practice				
P4i	Ability to use and apply information from technical literature				
P6i	Ability to use appropriate codes of practice and industry standards				
P7	Awareness of quality issues and their application to continuous improvement				
P11i	Awareness of team roles and the ability to work as a member of an engineering team				
P1	Understanding of contexts in which engineering knowledge can be applied (e.g. operations				
	and management, application and development of technology, etc.)				
P2	Knowledge of characteristics of particular materials, equipment, processes or products				
P3	Ability to apply relevant practical and laboratory skills				
P4	Understanding of the use of technical literature and other information sources				
P5	Knowledge of relevant legal and contractual issues				
P6	Understanding of appropriate codes of practice and industry standards				
P8	Ability to work with technical uncertainty				
P11	Understanding of, and the ability to work in, different roles within an engineering team				
Additional General Skills (G)					
G1	Apply their skills in problem solving, communication, information retrieval, working with others and the effective use of general IT facilities				

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G2	Plan self-learning and improve performance, as the foundation for lifelong learning/CPD
G3i	Plan and carry out a personal programme of work
G4i	Exercise personal responsibility, which may be as a team member



12 Course Requirements

12a Level 4:

In order to complete this course an apprentice must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value
ENG4091	Engineering Principles 1	20
ENG4124	Mathematical Modelling 1	20
ENG4093	Engineering Practice	20
ENG4094	Engineering Principles 2	20
ENG4125	Mathematical Modelling 2	20
ENG4096	Integrated Engineering Project	20

Level 5:

In order to complete this course an apprentice must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value
ENG5103	Operations Systems	20
ENG5104	Quality Systems	20
ENG5100	Design and Materials	20
ENG5097	Leading Engineering Endeavour	20
ENG5101	Design and Manufacture	20
ENG5105	Manufacturing Automation and Control	20

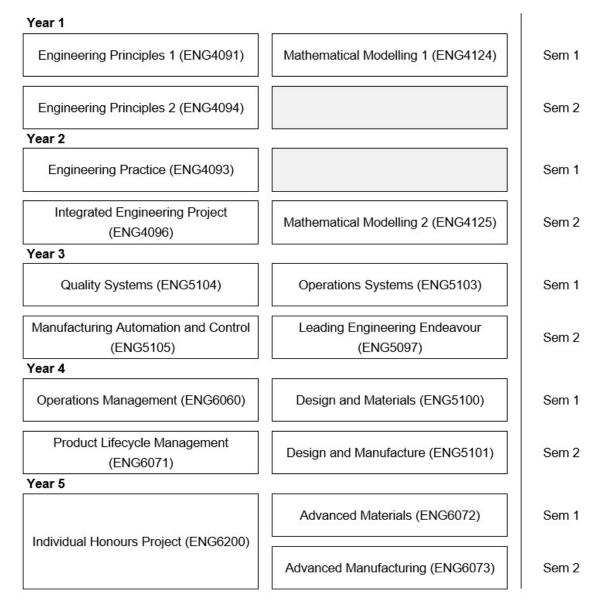
Level 6:

In order to complete this course an apprentice must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value
ENG6073	Advanced Manufacturing	20
ENG6072	Advanced Materials	20
ENG6071	Operations Management	20
ENG6070	Product Lifecycle Management	20
ENG6200	Individual Honours Project	40



Level 6 Degree Apprenticeship - Manufacturing Engineer



Apprentices with appropriate Level 4 equivalent qualification such as HNC will be able to join this degree apprenticeship at Year 3 of its delivery

Apprentices with appropriate Level 5 equivalent qualification such as HND or Foundation Degree or Level 5 Apprenticeship will be able to join this degree apprenticeship at Year 4 of its delivery as shown overleaf:

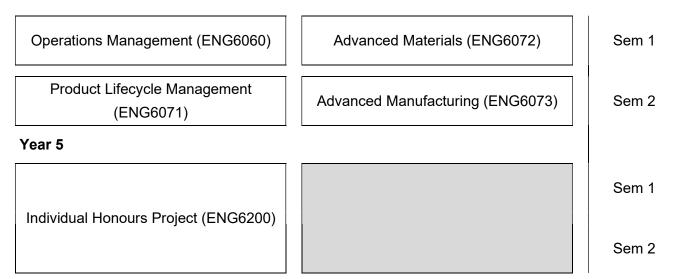


Top Up Apprenticeship Delivery - Manufacturing Engineering

Year 1 – Year 3



Year 4





13 Overall Apprentices Workload and Balance of Assessment

Overall an apprentice *workload* consists of class contact hours, independent learning and assessment activity, with each credit taken equating to a total study time of around 10 hours. While actual contact hours may depend on the optional modules selected, the following information gives an indication of how much time apprentices will need to allocate to different activities at each level of the apprenticeship.

- Scheduled Learning includes lectures, practical classes and workshops, contact time specified in timetable
- *Directed Learning* includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning
- Private Study includes preparation for exams

The *balance of assessment* by mode of assessment (e.g. coursework, exam and in-person) depends to some extent on the optional modules chosen by the apprentices. The approximate percentage of the course assessed by coursework, exam and in-person is shown below.

Level 4

Workload

% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	432
Directed Learning	0
Private Study	768
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	27%
Exam	47%
In-Person	26%

Level 5

Workload

% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	336
Directed Learning	32
Private Study	832
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	52%
Exam	28%
In-Person	20%



Level 6

<u>Workload</u>

% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	210
Directed Learning	44
Private Study	946
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	70%
Exam	0
In-Person	30%