



**ENGINEERING
MANUFACTURING
TECHNICIAN**
Apprenticeship

EMPLOYER FACTSHEET
GROW YOUR OWN TALENT

This occupation is found in large and small engineering and manufacturing organisations providing products and services throughout a wide range of sectors, such as Automotive, Aerospace/Airworthiness, Chemical Processing, Land Systems, Marine, Maritime Defence, Materials Manufacturers and their respective supply chains.

Key Information

Level	4
Duration	Typically 42 months
Entry requirements	- 16 years or over. - Please contact our Apprenticeship team for further entry requirements.
Delivery	A minimum of 30 hours of on the job training at work place, 2 days per week including a day to study at our Uxbridge campus
Occupation summary	The broad purpose of the occupation is to provide specialist technical support for engineers, so that organisations can develop, produce or test new/existing products, processes, or procedures to meet a customer specification in terms of quality, cost and delivery, as efficiently and effectively as possible.
Typical job titles	Typical job titles include Manufacturing Engineer Quality, Manufacturing Production Engineer, Manufacturing Procurement Engineer, Quality Engineer, Costing Engineer, Test and Commissioning Engineer, Installation Engineer, Process Engineer, Production Support Engineer.
Professional Recognition	IET / Eng Tech IMechE / Eng Tech Royal Aeronautical Society / Eng Tech

Choose a Trusted Provider

 <p>We are a top provider in London with consistently high success rates</p>	 <p>We are the largest college provider of apprenticeships in west London</p>
 <p>We work with major companies including Brunel University London, Martin-Baker Aircraft Limited & Menzies etc.</p>	 <p>Government funding may be available. Eligibility and criteria apply</p>

Employers involved in creating this standard:

GKN Aerospace, Jaguar Land Rover cars, BAE Systems, Toyota UK, GTA England, Leonardo Helicopters, British Plastics Federation, JCB, Siemens, Sheffield Forgemaster, Liberty Speciality Steels.

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Apprenticeships & Skills
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Qualifications

English and maths qualifications

Apprentices without level 2 English and maths will need to achieve this level prior to taking the End-Point Assessment. For those with an education, health and care plan or a legacy statement, the apprenticeship's English and maths minimum requirement is Entry Level 3. A British Sign Language (BSL) qualification is an alternative to the English qualification for those whose primary language is BSL.

Other qualifications

Mandatory qualifications applicable to all sectors (for both aerospace and non-aerospace apprentices)

Mandatory qualification 1: Pearson BTEC Level 4 Higher National Certificate in Engineering or Pearson BTEC Level 4 Higher National Certificate in Manufacturing Operations

Level of qualification: 4

Additional mandatory qualifications applicable only to Aerospace apprentices to meet Civil Aviation (CAA) requirements

Aerospace mandatory qualification 1: EAL Level 2 Diploma in Aerospace and Aviation Engineering (Foundation Competence)

Level of qualification: 2

Mandatory period of protected learning (only applicable to the Aerospace Sector)

To meet the requirements of Civil Aviation Authority (CAA) regulations all individuals trained against this standard must complete a period of mandatory protected training leading to successful achievement of the mandatory qualification 601/7289/7 EAL Level 2 Diploma in Aerospace and Aviation Engineering (Foundation Competence)

Aerospace mandatory qualification 2: EAL Level 4 Diploma in Engineering and Advanced Manufacturing (Development Competence)

Occupation duties

Duty

Duty 1 - Ensure the safe and efficient performance of every production task in compliance with company procedures, approved engineering data and local Health and Safety requirements. Ensure Safe Systems of Work and risk assessments (assisting as necessary in the completion of risk assessments) are adhered to for engineering or manufacturing activities.

Duty 2 - Prepare product and process documentation by collecting, analysing, and summarising information and trends.

Duty 3 - Manage internal and/or Supplier Quality Notifications, and liaison with the required stakeholders for resolution.

Duty 4 - Liaise with internal and external customers to implement programme initiatives, such as the application of lean analysis methods, processes and tools.

Duty 5 - Carry out new product introduction and/or existing product modifications within engineering and/or manufacturing by contributing to activities such as facilitation of quality activities (including any testing and/or commissioning requirements), supplier approvals, gate reviews.

Duty 6 - Deliver financial planning or costing analysis such as:- estimation of costs for manufacture, supplying drawings or specification for quotations, obtaining manufacture quotes, calculating costs associated with quality problem or machine downtime.

Duty 7 - Develop new technology initiatives by contributing to activities such as, justifying capital investment equipment/system upgrades from purchase through to installation and commissioning.

Duty 8 - Produce and maintain reports measuring Key Performance Indicators for data management activities.

Duty 9 - Ensure processes and current methods of engineering and manufacturing are as efficient and cost effective, such as:- utilising time and motion analysis, line balancing and flow to achieve the required level of production output.

Duty 10 - Liaise with appropriate internal and external stakeholders at all levels to ensure that engineering and manufacturing operations are completed in line with the agreed time scales. Examples of stakeholders could include production managers, production operatives, auditors, suppliers, customers.

Duty 11 - Ensure work process and outcomes comply with any local, national and or international regulatory or compliance requirements. Such as :- maintain compliance to Aerospace Regulatory bodies (CAA, EASA,MAA) as well as the wider regulations (such as Anti Bribery and Corruption, Export Control).

Duty 12 - Resolve identified engineering and/or manufacturing problems such as:- contributing to the root cause analysis exercise applying appropriate levels of containment and corrective action.

Duty 13 - Produce engineering and/or manufacturing documentation (such as:- Build Manuals, Standard Operating Instructions/processes, Bill of Materials) to aid and ensure consistent, compliant and cost effective manufacturing processes.

Duty 14 - Review engineering or manufacturing methods to determine the most effective and economical method whilst meeting drawing/specification requirements.

Knowledge

- 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

- 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 decisions.
- 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.

Skills (Continued)

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.

Behaviour

B1: Champions 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: Operates 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: Takes 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: Complies 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: Creates and maintains positive, professional, trusting and ethical working relationships with their team and the wider range of internal, external and connected stakeholders.

B7: Acts professionally with a positive and respectful attitude.