Overview of the role

Supporting the development of new electrical or electronic systems or components and resolving problems with existing systems or components.

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Standard in development
L6: Electrical or electronic engineer (degree)

Title of occupation

Electrical or electronic technical support engineer (degree)

UOS reference number

ST0024

Core and options

No

Level of occupation

Level 6

Occupational maps data

Route: Engineering and manufacturing
Pathway: Maintenance, Installation & Repair
Cluster: Manufacturing/Process Maintenance Engineer

Typical duration of apprenticeship

42 months

Degree apprenticeship

integrated degree

Resubmission

No

Would your proposed apprenticeship standard replace an existing framework?

No

Does professional recognition exist for the occupation?

Yes

Regulated occupation

Is this a statutory regulated occupation?

No

Occupation summary

This occupation is found in cross sectors such as aerospace, automotive, motorsport, maritime and other engineering or manufacturing sectors. Employers may be directly involved in these activities or as a service provider, original equipment manufacturer or approved solutions provider in large or small to medium organisations providing services such as system or component design or development.

The broad purpose of the occupation is to support engineering or manufacturing in both diagnostics and problem-solving, assembly and in design and development of electronic or electrical components and systems. Electrical or electronic technical support engineers support the activities involved in bringing a product concept to life and resolving issues within manufacturing, ensuring that equipment used is operating safely, efficiently and effectively.

In their daily work an employee in this occupation interacts with a range of other engineers, functions and managers both within their own organisation and their supply chain. They may spend their working day in a variety of locations such as in manufacturing or engineering work areas but with time also spent in an office environment.

An employee in this occupation will operate with autonomy and will be responsible for ensuring that products are launched, produced or delivered on time. They will be responsible for collecting, storing or supplying data in line with organisational requirements. They will also be responsible for ensuring that equipment is functional and may work to strict KPIs. They will also be responsible for keeping up to date with current and developing trends in the sector including developments in technology. They will have to ensure that their work meets safety and sustainability requirements and legislation.

Typical job titles

Electrical engineer Electrical support engineer Electronic technical support engineer Support engineer Technical support engineer

Are there any statutory/regulatory or other typical entry requirements?

No

Occupation duties

Duty	KSBs
Duty 1 Lead a safety culture in their defined work area at all times, ensuring their own safety and the safety of others.	K1 K2 K3 K8 K10 K13 K23 S6 S8 S14 S16 S18 B1 B2 B6
Duty 2 Ensure that electrical or electronic engineering projects comply with legislation, compliance testing, regulatory requirements, and sustainability requirements.	K1 K2 K3 K10 K11 K13 S6 S8 S10 S11 S16 B1 B2 B6 B7
Duty 3 Be proactive and take responsibility for identifying, developing and maintaining own personal and professional development.	K3 K6 K7 K12 K16 K17 K19 K20 S16 B5 B6
Duty 4 Work independently or as part of a team to provide specialist electrical or electronic engineering leadership.	K5 K11 K21 K23 K25 K27 S6 S12 S14 S16 S18 S19 B2 B3 B4 B6

Duty	KSBs
Duty 5 Determine the type and level of technical data and information required to complete the electrical or electronic engineering project or task outcome.	K3 K6 K7 K8 K11 K13 K16 K17 K18 K19 K20 K 26 S1 S2 S3 S4 S5 S9 S16 B6
Duty 6 Plan, organise and manage resources such as people, equipment, components and data to monitor progress, identify risks and any relevant mitigation to meet project or task outcomes.	K1 K2 K4 K7 K9 K13 K15 K18 K20 K22 K23 S3 S6 S7 S8 S9 S14 S15 S16 B1 B3 B6
Duty 7 Lead and deliver electrical or electronic projects or programmes of work to the agreed requirements, including schedule, quality and budget.	K1 K2 K3 K4 K6 K7 K9 K10 K13 K15 K18 K19 K20 K22 K26 K27 S1 S2 S4 S6 S7 S8 S9 S12 S13 S14 S16 S18 S19 B1 B2 B3 B6
Duty 8 Develop and maintain effective working relationships with stakeholders.	K5 K12 K21 K23 K25 S14 S15 S16 S17 S18 B2 B3 B4 B5 B6
Duty 9 Determine the appropriate problem solving and diagnostic tools and techniques to be used. Lead the problem-solving activity to enable development and modifications or updates to electrical or electronic engineering components, systems or equipment.	K11 K13 K21 S2 S5 S10 S11 S14 S16 S19 B6
Duty 10 Identify and lead electrical or electronic project and improvement activities such as supporting automation, digital transformation and other technological developments.	K7 K10 K11 K13 K14 K15 K18 K19 K20 K22 K 23 K26 K27 S1 S2 S4 S5 S6 S7 S8 S10 S12 S14 S16 S18 S19 B1 B2 B3 B6 B7

Duty	KSBs
Duty 11 Produce validated designs, developments, modifications or updates to electrical or electronic systems, equipment or components through computer aided design, modelling, “live” testing or using virtual simulation software to industry standards.	K1 K2 K4 K7 K8 K16 K17 K19 K24 K26 S2 S3 S4 S5 S7 S9 S11 S12 S13 S15 S16 B2 B5 B6 B7
Duty 12 Ensure all project or work programme documentation has been completed correctly and accurately to ensure it meets organisational compliance, industry standards or Key Performance Indicators (KPIs) and traceability requirements.	K1 K2 K8 K9 K12 K14 K15 K18 K23 K24 S1 S3 S4 S6 S8 S10 S12 S13 S15 S16 B1 B2 B6
Duty 13 Produce technical documentation with applicable supporting data or information, as required, to inform project outcomes and decision making.	K2 K8 K10 K11 K14 K15 K16 K18 K24 S1 S3 S4 S13 S15 S16 B2 B6
Duty 14 Identify and share good practice and work collaboratively.	K12 K14 K19 S10 S12 S14 S15 S16 S17 B1 B2 B3 B4 B5 B6

KSBs

Knowledge

K1: Safety, environmental, sustainability and security legislation, regulations and standards associated with electrical and electronic systems and the environments in which they reside. Cyber security, statutory safety standards, carbon zero, recycling and reusability targets.

K2: Hazards, risks and safe systems of work in am electrical and electronic environment including design safety of high voltage systems.

K3: Principles and applications of mechanics and thermal science in a engineering environment: motion, energy and force to ensure that systems and components function safely, efficiently and reliably.

K4: Factors that determine material selection relevant to electrical and electronic engineering.

K5: Verbal communication techniques. Giving and receiving information. Matching style to audience. Barriers in communication and ways to overcome them.

K6: Principles of mathematics and scientific methods including analytical techniques. Evaluating statistical data, complex numbers and matrices required in an electrical and electronic engineering environment.

K7: Electrical and electronic engineering principles used in the design and development of components equipment and systems including electromagnetism, the laws and theorems that govern electronic circuits: function of common digital and analogue electronic devices, passive circuit behaviour, modelling circuits, active electronic components, transformers, AC/DC, power electronics, motors and drives.

K8: Data collection, storage, and presentation: methods, benefits and risks.

K9: Project commercials: delays, changes and impacts.

K10: Techniques used for improving and enhancing the safety, reliability, quality, performance and sustainability of electrical and electronic components, equipment and systems.

K11: Troubleshooting methods for diagnosing problems, faults or establishing performance characteristics, supporting improvement opportunities.

K12: Workplace training and development techniques: personal and professional development. Coaching and transfer of knowledge.

K13: Processes used in an electrical and electronic engineering environment to optimise safety, efficiency, performance, productivity and sustainability.

K14: Quality management and assurance processes.

K15: Management of change (MOC) processes: requesting change, determining viability, planning, implementing and evaluating changes to a product, system or component. Adherence to MOC, risks and limitations of MOC approval.

K16: Principles of Computer Aided Design (CAD) and the application in an electrical and electronic engineering environment.

K17: Principles and applications of simulation software in an electrical and electronic engineering environment.

K18: Project management techniques for project delivery: planning, resource management, cost and budget control, risk, and quality.

K19: Current and emerging technology in an electrical and electronic engineering environment: mechanical and electrical integration, digitalisation, artificial intelligence, Internet of Things, automation, robotics, 3D printing, awareness of cloud computing and cyber security.

K20: Control and instrumentation principles of analogue and digital control systems including transducer systems and operation; measurement applications and error; principles of closed loop control systems, block diagrams.

K21: Collaboration working methods with stakeholders: best practice, quality and performance measures, issue resolution.

K22: Manufacturing methods: assembling components or sub-systems into finished electrical and electronic equipment or systems.

K23: Teamwork and leadership: negotiation techniques, conflict management and development techniques.

K24: Written communication techniques. Plain English principles. Manufacturing engineering terminology. Report writing.

K25: Equity, diversity, and inclusion in the workplace. Unconscious bias.

K26: Digital and embedded system principles including embedded systems and their development, number systems, Boolean algebra, logic gates, logic expressions, combinational logic, analogue to digital and digital to analogue converters, computer and microcomputer systems and architectures.

K27: Principles of software development and testing including coding languages and methodologies used to evaluate and verify the software meets the required specification in an electrical and electronic engineering environment.

Skills

S1: Translate conceptual ideas or technical requirements into developmental outcomes or operational designs, or specifications for systems or component to solve electrical or electronic challenges.

S2: Select, use and apply approved problem-solving methods to solve problems and determine solutions or actions such as Define, Measure, Analyse, Improve, and Control (DMAIC), Failure Mode Effects Analysis (FMEA), Plan-Do-Check-Act (PDCA) or fish bone diagrams.

S3: Collate and use a range of data and supporting documentation.

S4: Interpret and produce technical documentation such as schematic and circuit diagrams, engineering drawings or 3D CAD models, simulation models, project plans, engineering reports, test reports, fault reports or data analytics.

S5: Observe, record and draw accurate and auditable conclusions from data evidence.

S6: Manage assigned projects or programmes of work, taking into account factors such as planning, resource requirements, safety, quality, cost, performance and sustainability.

S7: Apply processes for project or programme management such as escalation, audit or risk management and risk mitigation.

S8: Comply with statutory and organisational safety standards and requirements, supporting safety risk assessments and mitigate any risks identified within the design, manufacture, development or test activity.

S9: Identify and use resources, such as digital tools or technologies, human, equipment, materials or data, to complete projects or programmes of work.

S10: Apply quality management and assurance processes to identify and rectify faults, inaccuracies, discrepancies or unexpected results during the electrical and electronic engineering process.

S11: Carry out pre operations checks of testing or prototyping equipment to ensure it has been correctly configured and checked for safe operation before use.

S12: Manage continuous improvement activities using techniques such as such as Six Sigma, 5s, Kaizen, Lean, Kanban, Statistical Process Control or Value Stream Mapping.

S13: Create, maintain and review project documentation. Record and action any non-conformities.

S14: Communicate with others verbally for example, colleagues and stakeholders.

S15: Communicate in writing for example reports and presentations.

S16: Collaborate with colleagues and stakeholders. Manage differing and competing interests with stakeholders.

S17: Identify and complete opportunities for personal and professional development.

S18: Apply and promote policies and practices to support equity, diversity and inclusion.

S19: Identify and rectify faults, inaccuracies, discrepancies or unexpected results during the electrical or electronic activity such as assembly, testing and commissioning processes which may impact the quality and reliability of the system or component or equipment.

Behaviours

B1: Promotes a healthy and safe working environment.

B2: Take responsibility for the compliance and quality of work in their area and enables others to meet these standards through effective communication, collaboration and teamwork.

B3: Agile and resilient in dealing with new and changing situations.

B4: Supportive of the needs and concerns of others, especially where this relates to diversity and inclusion.

B5: Committed to maintaining and enhancing competence of self and others through Continued Professional Development (CPD).

B6: Acts in an ethical and professional manner.

B7: Leads by example being an advocate for change and sustainable approaches.

Qualifications

English and Maths

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.

Does the apprenticeship need to include any mandated qualifications in addition to the above-mentioned English and maths qualifications?

Yes

Other mandatory qualifications

BEng or BSc Honours Electrical or Electronic Technical Support Engineer degree that fully aligns with the KSBs

Level: 6 (integrated degree)

Professional recognition

This standard aligns with the following professional recognition:

- Institute of Engineering and Technology (IET) for Incorporated Engineer (IEng)

Progression Routes

ST0456 Post graduate engineer L7

Supporting uploads

Mandatory qualification uploads

Mandated degree evidence uploads

Professional body confirmation uploads

Involved employers

BMW Group UK, EEF, Ford, GTA England, Institution of Mechanical Engineers, Jaguar Land Rover, NFEC, Siemens, Toyota Manufacturing UK, Vauxhall Motors

Subject sector area

4.2 Manufacturing technologies