Healthcare Engineering Specialist Technician Level 3 Apprenticeship Standard (ST0950) Specification

This guide describes the different types of End-Point Assessment tests, the test rules and who should be involved. Preparing for End-Point Assessment and working with SIAS are also covered.

SIAS is the science industry assessment service. It is part of the Cogent Skills Group. For further information about apprenticeship standards and Trailblazers please contact info@siasuk.com.

Contents

Qualification Objective

The aim of this qualification is to ensure that the apprentice is occupationally competent against the knowledge, skills and behaviours outlined in the assessment plan for this standard.

Healthcare Engineering Specialist Technicians are found in the engineering industry, working in the healthcare sector.

They work in sites where healthcare engineering takes place. This includes hospitals, dental hospitals and practices, clinics, prisons, ambulance trusts, care centres, health centres, hospices, GP practices, and mental health hospitals and secure units.

They work for NHS trusts, private healthcare providers, healthcare medical devices suppliers, healthcare estates suppliers and owners, or PFI (Private Finance Initiative) contractors.

Healthcare medical devices technicians work on medical devices. Healthcare estates technician work on plant, building services and systems. Most technicians work across a wide range of healthcare devices or healthcare estates.

They work in clinical settings and often have contact with patients. They may complete work where patients are present or where the medical device is connected to the patient. They witness patients in various stages of their illness or recovery.

Prior Learning

Typically, GCSE grade B / 5 or above in mathematics, plus four other GCSE subjects at grade C / 4 or above, one being a science-based subject.

Overview

The broad purpose of the occupation is to ensure patient safety and service continuity for specialist healthcare medical devices or healthcare estates in a clinical setting. They conduct planned maintenance to prevent issues occurring and reactive maintenance. Other duties include acceptance testing, installation, decommissioning, and safety tests and checks. Conducting handovers is an important part of the role. This requires explaining complex technical information and regulatory advice on healthcare devices or healthcare estates to clinical staff. Completing documentation and reports, and keeping stakeholders informed of their work status is also part of their role. As part of a team, they contribute to continuous improvement. They may support and coach others.

Healthcare medical devices technicians also conduct healthcare device audits, test, and calibrate equipment. Whereas healthcare estates technicians also manufacture parts, spares and components, and conduct site surveys.

They may work as part of a team or alone. They may spend a day at one site or work across sites. A driving license may be needed. They may use a company vehicle. They may work shifts or unsociable hours and may be required to be on-call.

In their daily work, they interact with other technicians, patients, healthcare staff and members of the public. Healthcare staff could include for example, consultants, doctors, nurses, dentists, pathology, and medical imaging staff. They may also have contact with suppliers and manufacturers. They typically report to a specialist engineering and estate managers.

They are responsible for completing their duties in line with company procedures and priorities. They must ensure a safe and secure environment for patients, staff, and visitors. And ensure patient dignity, respect and Caldicott principles (patient confidentiality) are met. They must comply with health and safety, environmental, sustainability, and engineering regulations and standards including specific healthcare requirements. They must comply with medical protocols for infection prevention and biohazard control. This may include wearing specialist healthcare Personal Protective Equipment (PPE). They work under limited direct supervision, ensuring the quality and accuracy of their own work and sometimes the work of others. They must ensure work is completed safely within agreed timescales, with minimal disruption to critical health services and within budgets. They must present a professional image of their employer and themselves.

Full-time apprentices will typically spend 48 months on-programme (before the gateway) working towards this occupational standard. All apprentices must spend a minimum of 12 months on-programme. All apprentices must spend a minimum of 20% of on-programme time undertaking off-the-job training.

This EPA consists of 3 discrete assessment methods. The assessment methods can be delivered in any order.

It will be possible to achieve the following grades in each End-Point Assessment method:

Assessment method 1. Observation with questions:

- fail
- pass
- distinction

Assessment method 2. Interview underpinned by a portfolio of evidence:

- fail
- pass

Assessment method 3. Multiple-choice test:

- fail
- pass
- distinction

Performance in these End-Point Assessment methods will determine the overall apprenticeship standard grade of:

- fail
- pass
- merit
- distinction

Competence Evaluation

During the apprenticeship, regular evaluation of the competence of the apprentice against the apprenticeship standard will help to ensure that they achieve full occupational competence by the end of their training, and they are ready for End-Point Assessment. Confirmation from the employer that the apprentice is fully competent is needed before End-Point Assessment can take place.

As competence evaluation is an in-programme activity, the process that is used for this has not been mandated. It is for the employer supported by their training provider to decide how they wish to do this. To help with this SIAS has produced the SIAS Competence Tracker.

Gateway Requirements

In addition to the employer's confirmation that the apprentice is working at or above the level of the occupational standard, the apprentice must have completed the following gateway requirements prior to starting EPA:

- achieved English and mathematics at Level 2. For those with an education, health and care plan or a legacy statement, the apprenticeship's English and mathematics minimum requirement is Entry Level 3. British Sign Language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.
- for the interview, compiled and submitted a portfolio of evidence.
- for the observation with questions and interview underpinned by a portfolio of evidence the employer must provide any workplace specific policies, requirements or instructions as requested by SIAS.

Assessment Methods

This EPA consists of 3 discrete assessment methods:

1. Observation with Questions
2. Interview underpinned by a portfolio of evidence
3. Multiple-Choice Test

Observation with Questions

An observation with questions involves an End-Point Assessor observing and questioning an apprentice undertaking work as part of their normal duties, in the workplace. This allows for a demonstration of the KSBs through naturally occurring evidence. The observation must be of an apprentice completing their usual work and simulation is not permitted. Apprentices must be observed by the End-Point Assessor completing work under normal working conditions. The End-Point Assessor will ask questions in relation to underpinning knowledge or where an opportunity to observe an activity has not naturally occurred.

The observation with questions must take 3 hours (assessment time). The time for questioning is included in the overall assessment time.

The observation with questions may not be split, other than to allow comfort breaks as necessary or to allow the apprentice to move from one location to another as required. Where breaks occur, they will not count towards the total assessment time.

The End-Point Assessor has the discretion to increase the time of the observation with questions by up to 10% to allow the apprentice to complete a task or respond to a question.

One End-Point Assessor may observe only one apprentice at any one time, to ensure quality and rigour.

Apprentices must be provided with information on the format of the observation with questions, including the timescales they will be working to before the start of the observation with questions. The time taken to give this information is exclusive of the assessment time.

The following activities should be observed during the observation:

- conduct planned and preventative maintenance for healthcare engineering specialist equipment.
- conduct testing and checks for healthcare engineering specialist equipment.
- ensure availability and performance of maintenance tools and equipment.
- complete documentation for healthcare engineering specialist work

The observation should be conducted in the following way, to take account of the occupational context in which the apprentice operates:

- the tasks should not take place in the presence of patients.
- the tasks must involve working with at least two different types of healthcare engineering specialist equipment relevant to the apprentice's option.

The End-Point Assessor must be unobtrusive whilst conducting the observation.

Questions must be asked. The purpose of questioning is to test the apprentice's breadth and depth of underpinning knowledge against the grading descriptors.

As only naturally occurring work is observed, those KSBs that the apprentice did not have the opportunity to demonstrate can be assessed via questioning, although these should be kept to a minimum.

The End-Point Assessor must ask a minimum of 10 open questions. They may ask follow-up questions where clarification is required.

The questions can be asked by the End-Point Assessor both during and after work completion. To remain as unobtrusive as possible, End-Point Assessors should ask questions during natural stops between tasks or after completion of work rather than disrupting the apprentice's flow.

The performance observed and responses to questions will be assessed holistically, against the grading descriptors for this assessment method.

The End-Point Assessor will make all grading decisions.

Observation with Questions Grading Descriptors

KSB Theme	Pass Descriptors In order to achieve a pass, apprentices must demonstrate all of the pass descriptors	Distinction descriptors In order to achieve a distinction, apprentices must demonstrate all the pass descriptors and all the distinction descriptors
Work environment K8 S6 S7 S8 S9 S31 B2	**P1** Identifies and documents risks and hazards present in the workplace including clinical risks. (K8, S6) **P2** Advises on and applies control measures to minimise these risks in line with company procedures, including specialist	**D1** Explains the importance of compliance with health, safety and environmental regulations, policy and requirements and clinical restrictions, with reference to the impact on individuals, the workplace and the environment. (K8)

KSB Theme	Pass Descriptors In order to achieve a pass, apprentices must demonstrate all of the pass descriptors	Distinction descriptors In order to achieve a distinction, apprentices must demonstrate all the pass descriptors and all the distinction descriptors
	healthcare PPE where required. (K8, S6) **P3** Conducts work in line with health, safety regulations, policy and requirements including signage and barriers. (S7) **P4** Conducts work in line with clinical restrictions in the work area. (S8) **P5** Conducts work in line with statutory and organisation environmental regulations, policy and requirements, including safe disposal of waste, recycling of materials and efficient use of resources in line with company procedures. (S9) **P6** Restores work area on completion of the activity. Returns any unused resources and consumables. (S31) **P7** Prioritises health and safety, sustainability, and the environment over other factors for example time and cost. (B2)	
Tools and equipment K19 S3 S4 S5	**P8** Selects hand tools, specialist tools and instruments including electrical safety test equipment appropriate for the task. (K19, S4) **P9** Uses hand tools, specialist tools and instruments in line with employer's or	**D2** Explains the importance of undertaking pre-checks of operating tools and equipment in line with manufacturers' and employers' requirements. (K19)

KSB Theme	Pass Descriptors In order to achieve a pass, apprentices must demonstrate all of the pass descriptors	Distinction descriptors In order to achieve a distinction, apprentices must demonstrate all the pass descriptors and all the distinction descriptors
	manufacturers' instructions. (K19, S4) **P10** Checks tools and equipment are safe for use. (K19, S3) **P11** Completes maintenance of tools and equipment including checking calibration records and calibration where required. (K19, S3) **P12** Stores tools and equipment safely on completion of work. (K19, S5)	
Communication K11 S14 S16 B3	**P13** Uses communication techniques suitable for the task with colleagues and stakeholders - verbal, written or electronic, using sector and industry terminology accurately. (K11, S14) **P14** Identifies and reports on progress and issues, or concerns where applicable, in line with company procedures. (S16) **P15** Represents the employer in a professional manner, taking account of equality and diversity considerations and act in a non-discriminatory manner. (B3)	**D3** Explains the importance of adapting their communication method to different audiences identified by the End-Point Assessor. (K11)
Documentation K14 K15 S13 S20	**P16** Collects and records data and completes electronic and paper documentation required for	**D4** Explains the importance of protecting data in line with legal and employer requirements. (K15)

KSB Theme	Pass Descriptors In order to achieve a pass, apprentices must demonstrate all of the pass descriptors	Distinction descriptors In order to achieve a distinction, apprentices must demonstrate all the pass descriptors and all the distinction descriptors
	the work activity accurately, legibly and in full. (K14, S13, S20) **P17** Complies with general data protection regulations (GDPR). (K15) **P18** Explains the process for the removal of patient identifiable data. (K15)	**D5** Analyses the data collected identifying any trends or issues. (S13)
Task instructions and procedures K20 K22 K24 K36 S10 S11 S12 B4	**P19** Reads and interprets information required to complete the activity – including engineering representations, drawings and graphical information and calibration requirements and certificates. (K20, K24, S12) **P20** Completes work in line with manufacturers' instructions and warranty requirements, standard operating procedures as appropriate and quality assurance principles and practices. (K22, K36, S10, S11) **P21** Takes responsibility to complete work with minimal supervision within limits of authority, asking for help where needed. (B4)	**D6** Explains the importance of completing tasks in line with manufacturers' instructions, warranty requirements and standard operating procedures. (K22, S10) **D7** Identifies and explains the potential issues that could arise and how they mitigate against them. (S12, B4)
Maintenance and equipment checks K33 S21 S25 S26 S29	**P22** Assesses condition of components and equipment identifying action required. (S25) **P23** Applies maintenance practices and techniques to	**D8** Analyses and evaluates alternative maintenance practices and techniques. (K33) **D9** Identifies ideas for preventative maintenance, after assessing the condition

KSB Theme	Pass Descriptors In order to achieve a pass, apprentices must demonstrate all of the pass descriptors	Distinction descriptors In order to achieve a distinction, apprentices must demonstrate all the pass descriptors and all the distinction descriptors
	address required action. (K33, S26) **P24** Locks off and isolates equipment and systems safely. (S21) **P25** Tests and checks equipment or system against quality and operational parameters. (S29)	of components and equipment. (S25)
Infection prevention and biohazard control K5 S30	**P26** Uses washer disinfectors, steam sterilisers or alternatives appropriate to the task and environment to decontaminate healthcare equipment and maintenance tools and equipment in line with medical protocols. (K5, S30)	**D10** Analyses and explains the importance of following medical protocols for infection prevention and biohazard control. (K5)

Fail – An apprentice will fail where they do not demonstrate all the pass descriptors.

Observation with Questions Knowledge, Skills and Behaviours

Ref	Grading descriptor
Knowledge	
K5	Medical protocols for infection prevention and biohazard control for example, cleaning and disinfection of tools, pre-work disinfection requirements, decontamination prior to disposal.
K8	Health and safety requirements: manual handling, Personal Protective Equipment (PPE), risk assessments and method statements, specialist healthcare PPE, clinical risk assessments, signage and barriers.
K11	Communication techniques: verbal, written, electronic. Matching style to audience. Barriers in communication and how to overcome them. Engineering terminology.
K14	Documentation methods and requirements - electronic and paper. For example, job records, timekeeping, service reports, checklists and condemn notices.

K15	Data protection requirements: General Data Protection Regulation (GDPR). Information governance. Removal of patient identifiable data.
K19	Machinery, tools, and equipment used in healthcare engineering. Purpose, safe correct use, maintenance, carriage and storage.
K20	Calibrated equipment requirements including calibration certificates.
K22	Manufacturers' instructions: what they are and how to use them. Warranties: what they are and impact on engineering work.
K24	Engineering representations, drawings, and graphical information.
K33	Maintenance practices and techniques: planned, preventative and predictive methods and frequency, and reactive.
K36	Quality assurance principles and practice. Record keeping.
Skills	
S3	Check tools and equipment including calibration records of test equipment where applicable. Complete maintenance of tools and equipment including calibration where required.
S4	Select and use hand tools, specialist tools and instruments including electrical safety test equipment.
S5	Store tools and equipment.
S6	Identify and document risks and hazards in the workplace. Advise on and apply control measures.
S7	Comply with health and safety regulations, legislation, and safe working practices including signage and barriers.
S8	Comply with any clinical restrictions in work area. For example, wearing healthcare PPE.
S9	Comply with statutory and organisation environmental and sustainability requirements: safe disposal of waste, re-cycling or re-use of materials and efficient use of resources.
S10	Follow manufacturers' instructions and procedures.
S11	Follow standard operating procedures.
S12	Read and interpret information. For example, text, data, engineering drawings, job card, work instructions, risk assessments, method statements, operation manuals.
S13	Collect and record data. For example, energy usage, test results.
S14	Communicate with colleagues and stakeholders for example, patients, colleagues, managers,' and the public – verbal, written or electronic. Use sector and industry terminology where appropriate.
S16	Identify and report on progress and issues or concerns where applicable.

S20	Enter information to record work activity. For example, job sheets, risk assessments, equipment service records, test results, handover documents and manufacturers' documentation, asset management records, work sheets, checklists, waste environmental records and any legal reporting requirements.
S21	Lock off and isolate equipment or systems.
S25	Assess condition of components and equipment. Identify action required.
S26	Apply maintenance practices and techniques. For example, clean, lubricate, replace parts.
S29	Test and check equipment or system against quality and operational parameters.
S30	Use washer disinfectors, steam sterilisers or alternatives to decontaminate healthcare equipment and maintenance tools and equipment.
S31	Restore the work area on completion of the activity. Return resources and consumables.
Behaviours	
B2	Prioritise health, safety, sustainability and the environment.
B3	Act professionally representing employer well. For example, respectful, friendly, courteous, tactful, uses appropriate language, instils confidence. Take account of equality and diversity considerations. Act in a non-discriminatory manner.
B4	Take responsibility. Completes work with minimal supervision. Knows own limitations and asks for help where needed.

Interview underpinned by a portfolio of evidence

An interview consists of an End-Point Assessor asking an apprentice a series of questions to assess their competence against the KSBs. The End-Point Assessor leads this process to obtain information from the apprentice to enable a structured assessment decision-making process.

An End-Point Assessor will conduct and assess the interview underpinned by portfolio of evidence. The interview must last for 90 minutes. The End-Point Assessor has the discretion to increase the time of the interview by up to 10% to allow the apprentice to complete their last answer.

The interview will have a minimum of 9 open questions – one per topic. During this method, the End-Point Assessor must combine questions from SIAS's question bank and those generated by themselves. The purpose of the questions will be to cover the following themes:

Core

- working in a healthcare setting
- organising healthcare engineering specialist work
- arranging stock and supplies
- fault-finding and taking action
- contributing to continuous improvement
- completing written reports

- team working
- installing and decommissioning healthcare engineering specialist equipment

Apprentices will be assessed in the context of healthcare devices or estates, as per the apprenticeship standard option they are completing.

Option 1: Healthcare medical devices technician

- calibrate healthcare equipment

Option 2: Healthcare estates technician

- manufacture basic parts, spares, or components for healthcare estates

Portfolio of evidence requirements

- Apprentices must compile a portfolio of evidence during the on-programme period of the apprenticeship
- It must contain evidence related to the KSBs that will be assessed by the interview
- The portfolio of evidence will typically contain 15 discrete pieces of evidence
- Evidence should be mapped by the apprentice against the KSBs assessed by the interview
- Evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is suggested
- Evidence sources may include:
    - workplace documentation, for example workplace policies and procedures, records, logbooks
    - witness statements
    - annotated photographs
    - video clips (maximum total duration 10 minutes); the apprentice should always be in view and identifiable

  This is not a definitive list; other evidence sources are possible.

    - It should not include any methods of self-assessment
    - Any employer contributions should focus on direct observation of performance (for example witness statements) rather than opinions
    - The evidence provided must be valid and attributable to the apprentice; the portfolio of evidence must contain a statement from the employer and apprentice confirming this
    - The portfolio of evidence must be submitted to SIAS at the gateway

The portfolio is not directly assessed. It underpins the interview and therefore will not be marked by SIAS. SIAS will review the portfolio in preparation for the interview but are not required to provide feedback after this review of the portfolio.

Apprentices must be given at least two-weeks' notice of the date and time of the interview.

Questions should be open and competence based. Additional follow up questions are allowed, to seek clarification and to make a judgement against the grading descriptors.

End-Point Assessors must use SIAS's question bank as a source for questioning and are expected to use their professional judgment to tailor those questions appropriately.

Apprentices must have access to their portfolio of evidence during the interview.

Apprentices can refer to and illustrate their answers with evidence from their portfolio of evidence, however the portfolio of evidence is not directly assessed.

Apprentices are expected to understand and use relevant occupational language that would be typical of a competent person in this occupation.

Evidence from the interview will be assessed holistically using the grading descriptors for this assessment method. KSBs met and answers to questions, will be recorded by the End-Point Assessor.

The End-Point Assessor will make all grading decisions.

Interview underpinned by a portfolio of evidence Grading Descriptors

KSB Descriptors	Pass Descriptors In order to achieve a pass, apprentices must demonstrate all of the pass descriptors
Working in a healthcare setting K1 K3	**P1** Explains the engineering function in their healthcare setting and within the wider sector, identifying: • the type of employers • supply chain • audits • stakeholder requirements and priorities including the importance of continuity of service (K1) **P2** Outlines the principles of clinical governance, explaining its benefits for patients and staff. (K1) **P3** Explains factors that need to be considered when working in a clinical environment including: • the patient's journey • patient contact protocols • patient safety, dignity, respect, confidentiality • Caldicott requirements • personal health and safety when working in the clinical environment (K3)
Organising healthcare engineering specialist work K10 K13ii S1 S15 B1 B6	**P4** Describes how they plan and schedule their own and others' work using appropriate techniques, work management systems and documentation. (K10, K13ii, S1) **P5** Describes how they negotiate with stakeholders such as clinical teams or authorised personnel. (S15) **P6** Describes how they adapt to meet patients' and stakeholders' needs for example, regarding work priority, continuity of service, minimal disruption. (B1, B6)
Arranging stock and supplies K21	**P7** Outlines how they monitor, obtain and check stock and supplies and complete returns. (K21, S2)

KSB Descriptors	Pass Descriptors In order to achieve a pass, apprentices must demonstrate all of the pass descriptors
S2	**P8** Identifies the factors they need to consider during this process. (K21, S2)
Fault-finding and taking action K34 K35 S27 S28	**P9** Explains how they use troubleshooting equipment and apply fault finding and problem-solving techniques to identity simple faults. (K34, S27) **P10** Describes how they apply practices and techniques to replace, fit and repair components to rectify faults. (K35, S28)
Contributing to continuous improvement K37 S32 B7	**P11** Describes how they apply continuous improvement techniques and devised suggestions for improvement for the benefit of the organisation, patient, client or work process. (K37, S32) **P12** Outlines plans for CPD, explaining how they keep up to date with industry developments. (B7)
Completing written reports K12 K13i S18 S19	**P13** Discusses their use of information technology to write reports for example adverse incident reports, technical investigations, equipment appraisals. (K12, K13i, S18, S19)
Team working K16 K17 S17 B5	**P14** Outlines how they provide information, guidance, or training to colleagues or stakeholders. (K17, S17) **P15** Outlines how they take account of equality, diversity and inclusion considerations to benefit team working and work activity. (K16, B5)
Installing and decommissioning healthcare specialist equipment K32 S22 S23 S24	**P16** Describes how they apply practices and techniques to assemble, position and fix equipment or components and **P17** Complete commissioning checks for healthcare specialist equipment. (K32i, S22, S23) **P18** Outlines how they apply practices and techniques to disconnect and remove equipment or components. (K32ii, S24) **P19** Completes storage measures to prevent deterioration where required. (K32ii, S24) **P20** Categorises equipment or components for re-use, disposal, or re-cycling. (K32ii, S24)
Option 1. Healthcare devices technician Calibrate healthcare equipment S33	**P21** Explains the process they take when calibrating healthcare equipment in line with operational requirements. (S33)

KSB Descriptors	Pass Descriptors In order to achieve a pass, apprentices must demonstrate all of the pass descriptors
Option 2. Healthcare estates technician Manufacture basic parts, spares, or components for healthcare estates S34	**P22** Justifies the manufacture of bespoke component or spare part. (S34) **P23** Explains when and how consent is achieved. (S34) **P24** Describes how they have used a range of processes to produce basic parts, spares or components. (S34)

Fail – An apprentice will fail where they do not demonstrate all the pass descriptors.

Interview underpinned by a portfolio of evidence Knowledge, Skills and Behaviours

Ref	Grading descriptor
Knowledge	
K1	Engineering function in the healthcare sector; roles, duties, interdependencies and reporting channels. Types of employers. Supply chain. Audits. Stakeholder requirements and priorities including the importance of continuity of service. Principles of clinical governance; its benefits for patients and staff.
K3	Working in a clinical environment. The patient's journey. Patient contact protocols. Patient safety, dignity, respect, confidentiality and Caldicott requirements. Personal health and safety when working in the clinical environment.
K10	Planning techniques, time management, workflow, work scheduling, work plans and documents. Work categorisation systems.
K12	Report writing
K13i **K13ii**	Information technology: email, word processing, spreadsheets. Information technology: work management systems
K16	Team working techniques. Equality, diversity, and inclusion in the workplace
K17	Training, mentoring and coaching techniques. How to pass on knowledge and provide guidance to customers or stakeholders.
K21	Stock and services considerations. Availability, stock lead times. Correct handling. The identification of equipment and parts. Function of parts, spares and components. Stock value. Faulty stock process. Returns process. Salvageability of parts to be removed.
K32i **K32ii**	Installation, commissioning practices and techniques. Decommissioning practices and techniques.
K34	Fault finding and problem-solving techniques: diagnostics, troubleshooting and testing for minor faults for example, component failure in system or circuit,

Ref	Grading descriptor
	lighting or socket failure, transformer issues, fire alarm system errors. Common causes of faults.
K35	Repair practices and techniques.
K37	Continuous improvement principles and practices for the benefit of the organisation, patient, client, or work process. For example, Lean, Six Sigma, Kaizen.
Skills	
S1	Plan and schedule own and others' work.
S2	Monitor, obtain and check stock and supplies, and complete returns.
S15	Negotiate with stakeholders such as clinical team or authorised person. For example, to access equipment or arrange system outage.
S17	Provide information, guidance, or training to colleagues or stakeholders. For example, clinical staff.
S18	Write reports. For example, adverse incident reports, technical investigations, equipment appraisals and specifications, improvement suggestions.
S19	Use information technology. For example, for document creation, communication, and information management
S22	Complete commissioning checks
S23	Assemble, position and fix equipment or components
S24	Disconnect and remove equipment or components. Categorise equipment and components for re-use, disposal, or re-cycling. Complete storage measures to prevent deterioration.
S27	Use troubleshooting equipment and apply fault-finding and diagnostic testing procedures to identify faults.
S28	Replace, fit and repair components
S32	Apply continuous improvement techniques. Devise suggestions for improvement
Option 1 – Healthcare Medical Devices Technician	
S33	Calibrate healthcare equipment.
Option 2 – Healthcare Estates Technician	
S34	Design and cut, drill, weld as appropriate to produce basic parts, spares or components where consent to manufacture is given.
Behaviours	
B1	Patient focus. For example, aims to maintain continuity of service and improve service, sensitive to clinical environment and maintains patient confidentiality.

Ref	Grading descriptor
B5	Team player. Keeps colleagues informed. Supports colleagues to complete work and develop. Considers implications of their own actions on others in the team.
B6	Adaptable. For example, responds positively to changing priorities and deadlines. Resilient under pressure. Manages multi-skilled tasks and works to deadlines.
B7	Committed to continued professional development. Keeps up to date with developments in the engineering industry and healthcare sector.

Multiple-Choice Test

The multiple-choice test can be:

- computer based
- paper based

It will consist of 40 questions.

These questions will consist of multiple-choice questions. The multiple-choice questions will have four options of which one will be correct.

Apprentices must have 60 minutes to complete the multiple-choice test. The multiple-choice test is closed book which means that the apprentice cannot refer to reference books or materials.

Multiple-Choice Test Knowledge, Skills and Behaviours

Ref	Grading descriptor
Core Knowledge	
K2	Technological development and innovation in the healthcare engineering sector. Industry 4.0. IT networking.
K4	Engineering standards and regulations. British Standards (BS). International Organisation for Standardisation standards (ISO). European Norm (EN). Standard Operating Procedures (SOP). What they are and how to use them.
K6	Healthcare engineering industry regulations and guidelines. Medicines and Healthcare products Regulatory Agency regulations. Care Quality Commission regulations. Health Technical Memorandums (HTMs). What they are and how to use them.
K7	Health and safety regulations. Health and Safety at Work Act. Control of Substances Hazardous to Health (CoSHH). Working in confined spaces. Lone working. Provision of Work Equipment Regulations (PUWER). Lifting Operations and Lifting Equipment Regulations (LOLER). Electrical safety and compliance. Noise regulation. L8 Legionella. Slips trips and falls. Display Screen Equipment. The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). What they are and how to use them.
K9	Environmental regulations and requirements. Environmental Protection Act. Sustainability. Waste Electrical and Electronic Equipment Directive (WEEE).

Ref	Grading descriptor
	Hazardous waste regulations. Re-cyclable materials and waste disposal procedures. Energy monitoring. Data logging to optimise energy performance. The Climate Change Agreements. Carbon Reduction Commitment (CRC). What they are and how to use them.
K18	Financial constraints. Service level agreements.
K23	Statutory certificates including electricity certificates, theatre validations.
K25	Engineering mathematical and scientific principles: calculations, conversions, flow rates and equipment sizing.
K26	Engineering materials and their properties; impact on use.
K27	Mechanical principles: motion and mechanics, storage and transfer of forces and energy in operation, motors and pumps.
K28	Electrical and electronic principles: principles of electricity and electronics, electric circuit theory, motors and pumps.
K29	Mechatronics principles: key components of integrated mechanical and electrical systems; their design and operation.
K30	Control systems principles
K31	Energy consumption and usage profiling.
Option 1 – Healthcare Medical Devices Technician	
K38	Purpose and operation of devices and impact on service continuity: • diagnostic and therapeutic equipment: anaesthetic machines, patient ventilators, and critical life support machines • operating theatre and pathology equipment • monitoring and infusion devices • portable imaging equipment and scanners including hand, CT (Computerised Tomography) and MRI (Magnetic Resonance Imaging) • renal dialysis equipment • gas delivery systems • assistive technology
K39	Physiology and anatomy in relation to medical equipment.
K40	BS EN 60601 and BS EN 62353 Safety testing of medical electrical equipment and medical electrical systems.
K41	Quality control systems: medical devices directive, lifecycle management and hazard notices.
K42	Networking and integration of healthcare medical devices - requirements for network connections between devices or systems.
Option 2 – Healthcare Estates Technician	

Ref	Grading descriptor
K43	Purpose and operation of estates; interconnections of systems and impact on service continuity: • critical theatre ventilation systems • life-critical medical electrical distribution for healthcare estates with back-up generators - Isolated Power Supply (IPS) and Uninterruptible Power pipeline Supply (UPS) • medical gas systems and medical air and vacuum • critical resilience back-up systems • high pressure gas supplies • high vacuum systems • medical sterilisation systems including sterilisers, washer disinfectors and ultrasonic cleaners • steam systems (clean steam, sterilisation) • hot and cold-water systems • lifts (safety checks and safe rescue) and patient hoists • nurse call systems • fire safety systems • foul and storm drains • heat, light and power systems, including boilers • energy management systems • catering equipment maintenance • domestic services and portering equipment • security equipment maintenance
K44	Estates engineering industry regulations and guidelines. Health Building Notes. Premises Assurance Model (PAM). What they are and how to use them.
K45	Health and safety regulations and requirements. Asbestos awareness. Working at height. Permits to work. Safety passports. Vehicle safety. Pressure Systems Safety Regulations (PSSR). Construction Skills Certification Scheme compliance. EH40 workplace exposure limits. Building Management System (BMS). Site survey requirements and processes. What they are and how to use them. Limits of role and role of specialist contractors on medical gas systems.
K46	System resilience. Site wide energy infrastructure and the associated resilience needed to ensure continuity of service. Uninterruptible Power Supply (UPS), Generators, Dual fuel systems.

Multiple-Choice Test Grade Descriptors

Grade	Minimum Mark	Maximum Mark
Pass	0	29
Merit	30	35
Distinction	36	40

Final Grade

All assessment methods are weighted equally in their contribution to the overall EPA grade.

Performance in the EPA will determine the apprenticeship grade of fail, pass, merit or distinction.

End-Point Assessors will individually grade the observation with questions and interview supported by a portfolio of evidence assessment methods. The multiple-choice test will be graded either by the End-Point Assessor where the test is paper-based, or by the testing platform where the assessment is computer-based.

SIAS will combine the individual assessment method grades to determine the overall EPA grade.

Apprentices who fail one or more assessment method will be awarded an overall EPA fail.

To gain an overall EPA pass, apprentices must achieve a pass in all the assessment methods.

To achieve an overall EPA merit, apprentices must achieve a distinction in the observation with questions, a pass in the interview underpinned by a portfolio of evidence and a pass in the multiple-choice test.

To achieve an overall EPA distinction, apprentices must achieve a distinction in the observation with questions, a pass in the interview underpinned by a portfolio of evidence and a distinction in the multiple-choice test.

Grades from individual assessment methods should be combined in the following way to determine the grade of the EPA as a whole:

Observation with Questions	Interview underpinned by Portfolio	Multiple Choice Test	Overall Grading
Fail	Any Grade	Any Grade	Fail
Any Grade	Fail	Any Grade	Fail
Any Grade	Any Grade	Fail	Fail
Pass	Pass	Pass	Pass
Pass	Pass	Distinction	Pass
Distinction	Pass	Pass	Merit
Distinction	Pass	Distinction	Distinction

Moderation

Assessment organisations will undertake moderation of End-Point Assessor decisions through observations and examination of documentation on a risk sampling basis. Results cannot be confirmed until moderation has been completed.

Re-takes / re-sits

Apprentices who fail one or more assessment method(s) will be offered the opportunity to take a re-sit or a re-take at the employer's discretion. The apprentice's employer will need to agree that either a re-sit or re-take is an appropriate course of action.

A re-sit does not require further learning, whereas a re-take does.

Apprentices should have a supportive action plan to prepare for a re-sit or a re-take.

The timescale for a re-sit or re-take is agreed between the employer and SIAS. A re-sit is typically taken within 2 months of the EPA outcome notification. The timescale for a re-take is dependent on how much re-training is required and is typically taken within 4 months of the EPA outcome notification.

All failed assessment methods must be re-sat or re-taken within a 6-month period from the EPA outcome notification, otherwise the entire EPA will need to be re-sat or re-taken.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to a higher grade.

Where any assessment method has to be re-sat or re-taken, the apprentice will be awarded a maximum EPA grade of pass, unless the SIAS determines there are exceptional circumstances.

Certification

The outcomes from the End-Point Assessment will be reviewed and a grade conferred by SIAS in accordance with SIAS QA procedures, which are available from SIAS. SIAS will notify the employer of the outcome of each of the assessments.

SIAS will apply for the apprentice's certificate, which will be sent by ESFA. The certificate confirms that the apprentice has passed the End-Point Assessment, has demonstrated full competency across the standard and is job-ready.

Assessment Specification

The assessment specification can be found in the published assessment plan for the standard. Details of which elements of the apprenticeship standard will be tested by each test are given in the Mapping knowledge, skills, and behaviours section of this guide.

Mapping of knowledge, skills, and behaviours

Key:	
Observation with Questions	Obs
Interview underpinned by a portfolio of evidence	Int
Multiple-Choice Test	MCT

Ref	KSB to be assessed	Assessment Method
Knowledge		
K1 Engineering function in the healthcare sector; roles, duties, interdependencies and reporting channels. Types of employers. Supply chain. Audits. Stakeholder requirements and priorities including the importance of continuity of service. Principles of clinical governance; its benefits for patients and staff.		
K1	Engineering function in the healthcare sector; roles, duties, interdependencies and reporting channels. Types of employers. Supply chain. Audits. Stakeholder requirements and priorities including the importance of continuity of service. Principles of clinical governance; its benefits for patients and staff.	Int
K2	Technological development and innovation in the healthcare engineering sector. Industry 4.0. IT networking.	MCT
K3	Working in a clinical environment. The patient's journey. Patient contact protocols. Patient safety, dignity, respect, confidentiality and Caldicott requirements. Personal health and safety when working in the clinical environment.	Int
K4	Engineering standards and regulations. British Standards (BS). International Organisation for Standardisation standards (ISO). European Norm (EN). Standard Operating Procedures (SOP). What they are and how to use them.	MCT
K5	Medical protocols for infection prevention and biohazard control for example, cleaning and disinfection of tools, pre-work disinfection requirements, decontamination prior to disposal.	Obs
K6	Healthcare engineering industry regulations and guidelines. Medicines and Healthcare products Regulatory Agency regulations. Care Quality Commission regulations. Health Technical Memorandums (HTMs). What they are and how to use them.	MCT
K7	Health and safety regulations. Health and Safety at Work Act. Control of Substances Hazardous to Health (COSHH). Working in confined spaces. Lone working. Provision of Work Equipment Regulations (PUWER). Lifting Operations and Lifting Equipment Regulations (LOLER). Electrical safety and compliance. Noise regulation. L8	MCT

Ref	KSB to be assessed	Assessment Method
	Legionella. Slips trips and falls. Display Screen Equipment. The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR). What they are and how to use them.	
K8	Health and safety requirements: manual handling, Personal Protective Equipment (PPE), risk assessments and method statements, specialist healthcare PPE, clinical risk assessments, signage and barriers.	Obs
K9	Environmental regulations and requirements. Environmental Protection Act. Sustainability. Waste Electrical and Electronic Equipment Directive (WEEE). Hazardous waste regulations. Re-cyclable materials and waste disposal procedures. Energy monitoring. Data logging to optimise energy performance. The Climate Change Agreements. Carbon Reduction Commitment (CRC). What they are and how to use them.	MCT
K10	Planning techniques, time management, workflow, work scheduling, work plans and documents. Work categorisation systems.	Int
K11	Communication techniques: verbal, written, electronic. Matching style to audience. Barriers in communication and how to overcome them. Engineering terminology.	Obs
K12	Report writing.	Int
K13i **K13ii**	Information technology: email, word processing, spreadsheets. Information technology: work management systems.	Int
K14	Documentation methods and requirements - electronic and paper. For example, job records, timekeeping, service reports, checklists and condemn notices.	Obs
K15	Data protection requirements: General Data Protection Regulation (GDPR). Information governance. Removal of patient identifiable data.	Obs
K16	Team working techniques. Equality, diversity, and inclusion in the workplace.	Int
K17	Training, mentoring and coaching techniques. How to pass on knowledge and provide guidance to customers or stakeholders.	Int
K18	Financial constraints. Service level agreements.	MCT
K19	Machinery, tools, and equipment used in healthcare engineering. Purpose, safe correct use, maintenance, carriage and storage.	Obs
K20	Calibrated equipment requirements including calibration certificates.	Obs
K21	Stock and services considerations. Availability, stock lead times. Correct handling. The identification of equipment and parts. Function	Int

Ref	KSB to be assessed	Assessment Method
	of parts, spares and components. Stock value. Faulty stock process. Returns process. Salvageability of parts to be removed.	
K22	Manufacturers' instructions: what they are and how to use them. Warranties: what they are and impact on engineering work.	Obs
K23	Statutory certificates including electricity certificates, theatre validations.	MCT
K24	Engineering representations, drawings, and graphical information.	Obs
K25	Engineering mathematical and scientific principles: calculations, conversions, flow rates and equipment sizing.	MCT
K26	Engineering materials and their properties; impact on use.	MCT
K27	Mechanical principles: motion and mechanics, storage and transfer of forces and energy in operation, motors and pumps.	MCT
K28	Electrical and electronic principles: principles of electricity and electronics, electric circuit theory, motors and pumps.	MCT
K29	Mechatronics principles: key components of integrated mechanical and electrical systems; their design and operation.	MCT
K30	Control systems principles.	MCT
K31	Energy consumption and usage profiling.	MCT
K32i **K32ii**	Installation, commissioning practices and techniques. Decommissioning practices and techniques.	Int
K33	Maintenance practices and techniques: planned, preventative and predictive methods and frequency, and reactive.	Obs
K34	Fault finding and problem-solving techniques: diagnostics, troubleshooting and testing for minor faults for example, component failure in system or circuit, lighting or socket failure, transformer issues, fire alarm system errors. Common causes of faults.	Int
K35	Repair practices and techniques.	Int
K36	Quality assurance principles and practice. Record keeping.	Obs
K37	Continuous improvement principles and practices for the benefit of the organisation, patient, client, or work process. For example, Lean, Six Sigma, Kaizen.	Int
Option 1 – Healthcare Medical Devices Technician		
K38	Purpose and operation of devices and impact on service continuity: diagnostic and therapeutic equipment: anaesthetic machines, patient ventilators, and critical life support machines, operating theatre and pathology equipment, monitoring and infusion devices, portable	MCT

Ref	KSB to be assessed	Assessment Method
	imaging equipment and scanners including hand, CT (Computerised Tomography) and MRI (Magnetic Resonance Imaging), renal dialysis equipment, gas delivery systems, assistive technology	
K39	Physiology and anatomy in relation to medical equipment.	MCT
K40	BS EN 60601 and BS EN 62353 Safety testing of medical electrical equipment and medical electrical systems.	MCT
K41	Quality control systems: medical devices directive, lifecycle management and hazard notices.	MCT
K42	Networking and integration of healthcare medical devices - requirements for network connections between devices or systems.	MCT
Option 2 – Healthcare Estates Technician		
K43	Purpose and operation of estates; interconnections of systems and impact on service continuity: • critical theatre ventilation systems • life-critical medical electrical distribution for healthcare estates with back-up generators - Isolated Power Supply (IPS) and Uninterruptible Power pipeline Supply (UPS) • medical gas systems and medical air and vacuum • critical resilience back-up systems • high pressure gas supplies • high vacuum systems • medical sterilisation systems including sterlizers, washer disinfectors and ultrasonic cleaners • steam systems (clean steam, sterilisation) • hot and cold-water systems • lifts (safety checks and safe rescue) and patient hoists • nurse call systems • fire safety systems • foul and storm drains • heat, light and power systems, including boilers • energy management systems • catering equipment maintenance • domestic services and portering equipment	MCT

Ref	KSB to be assessed	Assessment Method
	security equipment maintenance	
K44	Estates engineering industry regulations and guidelines. Health Building Notes. Premises Assurance Model (PAM). What they are and how to use them	MCT
K45	Health and safety regulations and requirements. Asbestos awareness. Working at height. Permits to work. Safety passports. Vehicle safety. Pressure Systems Safety Regulations (PSSR). Construction Skills Certification Scheme compliance. EH40 workplace exposure limits. Building Management System (BMS). Site survey requirements and processes. What they are and how to use them. Limits of role and role of specialist contractors on medical gas systems.	MCT
K46	Site wide energy infrastructure and the associated resilience needed to ensure continuity of service. Uninterruptible Power Supply (UPS), Generators, Dual fuel systems.	MCT
Skills		
S1	Plan and schedule own and others' work.	Int
S2	Monitor, obtain and check stock and supplies, and complete returns.	Int
S3	Check tools and equipment including calibration records of test equipment where applicable. Complete maintenance of tools and equipment including calibration where required.	Obs
S4	Select and use hand tools, specialist tools and instruments including electrical safety test equipment.	Obs
S5	Store tools and equipment.	Obs
S6	Identify and document risks and hazards in the workplace. Advise on and apply control measures.	Obs
S7	Comply with health and safety regulations, legislation, and safe working practices including signage and barriers.	Obs
S8	Comply with any clinical restrictions in work area. For example, wearing healthcare PPE.	Obs
S9	Comply with statutory and organisation environmental and sustainability requirements: safe disposal of waste, re-cycling or re-use of materials and efficient use of resources.	Obs
S10	Follow manufacturers' instructions and procedures.	Obs
S11	Follow standard operating procedures.	Obs

Ref	KSB to be assessed	Assessment Method
S12	Read and interpret information. For example, text, data, engineering drawings, job card, work instructions, risk assessments, method statements, operation manuals.	Obs
S13	Collect and record data. For example, energy usage, test results.	Obs
S14	Communicate with colleagues and stakeholders for example, patients, colleagues, managers,' and the public – verbal, written or electronic.	Obs
S15	Negotiate with stakeholders such as clinical team or authorised person. For example, to access equipment or arrange system outage.	Int
S16	Identify and report on progress and issues or concerns where applicable.	Obs
S17	Provide information, guidance, or training to colleagues or stakeholders. For example, clinical staff.	Int
S18	Write reports. For example, adverse incident reports, technical investigations, equipment appraisals and specifications, improvement suggestions.	Int
S19	Use information technology. For example, for document creation, communication, and information management.	Int
S20	Enter information to record work activity. For example, job sheets, risk assessments, equipment service records, test results, handover documents and manufacturers' documentation, asset management records, work sheets, checklists,	Obs
S21	Lock off and isolate equipment or systems.	Obs
S22	Complete commissioning checks.	Int
S23	Assemble, position and fix equipment or components.	Int
S24	Disconnect and remove equipment or components. Categorise equipment and components for re-use, disposal, or re-cycling. Complete storage measures to prevent deterioration.	Int
S25	Assess condition of components and equipment. Identify action required.	Obs
S26	Apply maintenance practices and techniques. For example, clean, lubricate, replace parts	Obs
S27	Use troubleshooting equipment and apply fault-finding and diagnostic testing procedures to identify faults.	Int
S28	Replace, fit and repair components.	Int
S29	Test and check equipment or system against quality and operational parameters.	Obs

Ref	KSB to be assessed	Assessment Method
S30	Use washer disinfectors, steam sterilisers or alternatives to decontaminate healthcare equipment and maintenance tools and equipment.	Obs
S31	Restore the work area on completion of the activity. Return resources and consumables	Obs
S32	Apply continuous improvement techniques. Devise suggestions for improvement.	Int
Option 1 – Healthcare Medical Devices Technician		
S33	Calibrate healthcare equipment.	Int
Option 2 – Healthcare Estates Technician		
S34	Design and cut, drill, weld as appropriate to produce basic parts, spares or components where consent to manufacture is given.	Int
Behaviours		
B1	Patient focus. For example, aims to maintain continuity of service and improve service, sensitive to clinical environment and maintains patient confidentiality.	Int
B2	Prioritise health, safety, sustainability and the environment.	Obs
B3	Act professionally representing employer well. For example, respectful, friendly, courteous, tactful, uses appropriate language, instils confidence. Take account of equality and diversity considerations. Act in a non-discriminatory manner.	Obs
B4	Take responsibility. Completes work with minimal supervision. Knows own limitations and asks for help where needed.	Obs
B5	Team player. Keeps colleagues informed. Supports colleagues to complete work and develop. Considers implications of their own actions on others in the team.	Int
B6	Adaptable. For example, responds positively to changing priorities and deadlines. Resilient under pressure. Manages multi-skilled tasks and works to deadlines.	Int
B7	Committed to continued professional development. Keeps up to date with developments in the engineering industry and healthcare sector.	Int

Further Information

For information about SIAS policies, quality assurance, re-sits, appeals, complaints and general enquiries please see our website: www.siasuk.com

or contact:

SIAS – 01925515211 - info@siasuk.com

Floor 1, 720 Mandarin Court
Centre Park, WARRINGTON
WA1 1GG

T: 01925 515211
E: info@siasuk.com
W: www.siasuk.com