SIAS Qualification Specification

SIAS Level 3 Diploma in Understanding Healthcare Estates Engineering

Qualification Number: 610/6487/7

Operational Start Date: 1st October 2025

Contents

Version History

This is a live document and as such will be updated when required. It is the responsibility of the approved centre to ensure the most up-to-date version of the Qualification Specification is in use.

Version	Date	Comments
1.0	26/09/2025	First published

Introduction

Welcome to SIAS

SIAS is an Awarding Organisation regulated in England by the Office of Qualifications and Examinations Regulation (Ofqual) and in Northern Ireland by the Council for Curriculum, Examination and Assessment Regulation (CCEA Regulation).

We exist to drive positive change, and across STEM industries globally, we empower learners to achieve their full potential.

As the leading Awarding Organisation for the technical science, manufacturing, engineering and low carbon sectors, we are disrupting through innovative and collaborative approaches.

Our mission is to deliver transformational experiences and solutions that support the skills agenda.

Feedback

Customer experience and feedback is very important to us. We're always open to suggestions when it comes to enhancing and improving our services. If you have any comments or feedback on our services or products, please contact our team at info@siasuk.com or call us on 01925 515211.

About this Specification

This document has been developed to provide information for learners and centres undertaking, delivering or quality assuring this qualification.

Centre Recognition and Qualification Approval

To deliver this qualification, the centre must be recognised by SIAS.

Recognised centres must apply for approval for each qualification they intend to offer. Qualification approval must be obtained prior to conducting any learner assessments.

For details of our centre recognition and qualification approval process, visit our website or contact us at info@siasuk.com.

About this Qualification

Key Facts

Qualification Title	SIAS Level 3 Diploma in Understanding Healthcare Estates Engineering
Qualification Number	610/6487/7
Credit Value	48
Guided Learning Hours (GLH)	318
Total Qualification Time (TQT)	480
Assessment Methods	• Multiple choice question examinations (Units 1 to 4) • Short answer question examinations (Units 5 and 6) • Workbook (Unit 7) • Centre devised assessments (Units 8 to 10)
Operational Start Date	1 October 2025
Review Date	30 September 2028
Operational End Date	-
Certification End Date	-
Regulation	This qualification is regulated by CCEA Regulation

Qualification Objective

The SIAS Level 3 Diploma in Understanding Healthcare Estates Engineering aims to provide learners with a comprehensive understanding of the knowledge required to operate effectively as a technician within healthcare estates. The qualification supports the development of core theoretical knowledge in areas such as health and safety, engineering principles, healthcare estates maintenance, fault diagnosis and working as part of the wider healthcare estates team. It is designed to support progression into further training or employment within the sector.

Entry Requirements

This qualification is available for learners aged 16+.

There are no formal entry requirements for the SIAS Level 3 Level 3 Diploma in Understanding Healthcare Estates Engineering. However, learners should have a basic understanding of English and mathematics. Centres should also ensure learners are able to complete this qualification, for example, through completing an initial assessment to ensure they can work at the appropriate level.

Recognition of Prior Learning

Recognition of Prior Learning (RPL) is the process of recognising previous, informal or experiential learning so that the learner avoids having to repeat learning or assessment within a new qualification. SIAS supports the use of RPL and centres must work to the principles included in the SIAS RPL Policy which is available on the SIAS website. This policy should be reviewed alongside this guide and all other relevant SIAS qualification documentation.

Where a unit is contained within other SIAS qualifications, learners can transfer the achievement of this unit.

The following units are contained in the SIAS Level 2 Certificate in the Fundamentals of Healthcare Estates:

Ofqual Unit Reference	Unit title
K/651/4619	Principles of health, safety, and the environment within healthcare estates engineering
R/651/4620	Communication and teamwork within healthcare estates engineering
T/651/4621	Understand the healthcare engineering sector
Y/651/4622	Basic principles of healthcare estates maintenance

Qualification Structure

To achieve the SIAS Level 3 Diploma in Understanding Healthcare Estates Engineering learners must achieve the following:

- All mandatory units contained in the table below

Ofqual Unit reference	Unit title	Level	Credit	GLH	TQT
K/651/4619	Principles of health, safety, and the environment within healthcare estates engineering	2	3	20	30
R/651/4620	Communication and teamwork within healthcare estates engineering	2	3	22	30
T/651/4621	Understand the healthcare engineering sector	2	6	42	60
Y/651/4622	Basic principles of healthcare estates maintenance	2	6	44	60
Y/651/7927	Healthcare engineering and clinical environment management	3	3	20	30
A/651/7928	Understand engineering principles including mechanical, electrical and mechatronics	3	5	30	50
D/651/7929	Understand estates systems and supplies (water, gas, and electrical)	3	9	60	90

J/651/7930	Understand machinery, tools and equipment and materials used in healthcare engineering	3	6	40	60
K/651/7931	Understand quality assurance and continuous improvement in engineering maintenance	3	3	15	30
L/651/7932	Understand engineering maintenance processes and documentation for healthcare settings	3	4	25	40
TOTAL			**48**	**318**	**480**

Total Qualification Time (TQT) and Guided Learning Hours (GLH)

Note: Values for Total Qualification Time, including Guided Learning Hours, are calculated by considering the different activities that learners would typically complete to achieve and demonstrate the learning outcomes of a qualification. They do not include activities which are required by a learner's teacher based on the requirements of an individual learner and/or cohort. Individual learners' requirements and individual teaching styles mean there will be variation in the actual time taken to complete a qualification. Values for Total Qualification Time, including Guided Learning, are estimates.

Some examples of activities which can contribute to Total Qualification Time include:

- Independent and unsupervised research/learning
- Unsupervised compilation of a portfolio of work experience
- Unsupervised e-learning
- Unsupervised e-assessment practice
- Unsupervised coursework
- Watching a pre-recorded podcast or webinar
- Unsupervised work-based learning
- All Guided Learning

Some examples of activities which can contribute to Guided Learning include:

- Classroom-based learning supervised by a teacher
- Work-based learning supervised by a teacher
- Live webinar or telephone tutorial with a teacher in real time
- E-learning supervised by a teacher in real time
- All forms of assessment which take place under the immediate guidance or supervision of a lecturer, supervisor, tutor or other appropriate provider of

education or training, including where the assessment is competence-based and may be turned into a learning opportunity

Grading

This qualification is graded as a pass/fail.

Delivery and Assessment

Geographical Coverage

This qualification is regulated in Northern Ireland.

Use of Language

All learners must be assessed in English unless the qualification specification states that another language will be accepted.

Progression Opportunities

Upon successfully completing this qualification, learners may progress to:

- SIAS Level 3 Extended Diploma for Healthcare Estates Engineering Technicians

Delivery Guidance

The total qualification time for this qualification is 480 hours and of this 318 are recommended as guided learning hours.

Centres should ensure that any learner registered on a SIAS qualification undertakes a form of initial assessment. The initial assessment should be used to inform a teacher/trainer of the level of the learner's current knowledge and/or skills and any additional specific support requirements the learner may need.

Centres can deliver this qualification through various modes, ensuring flexibility and accessibility for learners. Recommended delivery modes include:

- **Classroom-Based Learning:** Traditional face-to-face learning.
- **Online Learning:** Online learning using virtual learning environments (VLEs).
- **Blended Learning:** A combination of classroom-based and online learning, allowing learners to benefit from both face-to-face interaction and online resources.

Centres should adopt a delivery approach which supports the development of all learners. Centres should ensure that all learning materials, including textbooks, digital content, and any other resources, are accessible to all learners. This includes providing alternative formats where necessary.

Each unit includes indicative content that outlines the key topics that should be taught, and which learners could be assessed on. Training providers can utilise this content to design schemes of work tailored to meet learning objectives effectively.

Assessment Guidance

All SIAS assessments will be accessible and produce results that are valid, reliable, transparent and fair.

To achieve the qualification, learners must successfully pass all assessments:

Unit Title	Assessment Method	Set by	Marked by
Principles of health, safety, and the environment within healthcare estates engineering	Externally set and marked multiple-choice question examination	SIAS	SIAS
Communication and teamwork within healthcare estates engineering	Externally set and marked multiple-choice question examination	SIAS	SIAS
Understand the healthcare engineering sector	Externally set and marked multiple-choice question examination	SIAS	SIAS
Basic principles of healthcare estates maintenance	Externally set and marked multiple-choice question examination	SIAS	SIAS
Healthcare engineering and clinical environment management	Externally set and marked short answer question examination	SIAS	SIAS
Understand engineering principles including mechanical, electrical and mechatronics	Externally set and marked short answer question examination	SIAS	SIAS
Understand estates systems and supplies (water, gas, and electrical)	Externally set and internally marked workbook	SIAS	Centre
Understand machinery, tools and equipment and materials used in healthcare engineering	Centre devised	Centre	Centre
Understand quality assurance and continuous improvement in engineering maintenance	Centre devised	Centre	Centre
Understand engineering maintenance processes and documentation for healthcare settings	Centre devised	Centre	Centre

Multiple-choice and Short Answer Question Examinations

Multiple-choice and short answer question examinations as set out in the table above are externally set and marked by SIAS. These assessments are available online through the SIAS XAMS platform.

The multiple-choice and short answer question examinations must be undertaken in controlled conditions. This means:

- learners must complete the assessment unaided.
- books and other training aids must not be accessed by the learners.

All assessment evidence for internally assessed units must be retained for a minimum of 3 years for audit purposes.

Learners who fail to achieve a pass will be permitted to retake the assessment twice. Learners may only seek a resit for any previously failed assessment.

Centres should have systems in place to verify a learner is ready to undertake their assessment.

Centres must ensure that no part of the assessment of a learner including internal quality assurance and invigilation, is conducted by anyone with a personal interest in the assessment outcome.

Learner Assessment Workbook

The following unit is assessed through an externally set and internally marked workbook:

- Unit 7: Understand estates systems and supplies (water, gas, and electrical)

The questions within the SIAS Learner Assessment Workbook will cover all the learning outcomes and assessment criteria from the mandatory unit within this qualification. This workbook is internally marked and quality assured by the centre, using the provided marking guidance, and externally quality assured by SIAS.

All assessment criteria must be met to achieve the unit.

Centres are NOT permitted to use their own workbook. The SIAS Learner Assessment Workbook and Marking Guide for this unit is available to download from Pinacle.

All knowledge assessment evidence must be retained for a minimum of 3 years for audit purposes and be available to the EQA upon request. Learners who fail to achieve a pass will be permitted to retake the assessment. Centres must ensure that no part of the assessment of a learner including internal quality assurance, is conducted by anyone with a personal interest in the assessment outcome. Centres are responsible for ensuring assessment decisions are valid and reliable, and that work submitted for assessment by learners is prepared and produced independently and free of plagiarism. Documentation to support the qualification assessment process can be accessed from the SIAS Pinacle system.

Centre Devised Assessment

All centre-devised assessments must be approved by SIAS prior to use. This ensures that:

- The assessments are appropriate for the qualification level.
- All learning outcomes and assessment criteria are fully and fairly assessed.
- The assessment methodology aligns with SIAS' quality standards and regulatory requirements.

Centres must submit assessment materials to SIAS in advance of delivery. Only approved assessments may be used for summative purposes.

Assessing Knowledge

Knowledge-based assessment is intended to evaluate what learners know and understand, in alignment with Ofqual's Level descriptors[1]. For the SIAS Level 3 Extended Diploma for Healthcare Estates Engineering Technicians assessments must reflect the depth and breadth of knowledge expected at level 3.

All knowledge assessments must meet the following principles:

- **Fair** – accessible, unbiased, and inclusive
- **Valid** – accurately measure the intended knowledge and understanding
- **Reliable** – consistent and repeatable across assessors and learners
- **Authentic** – produced by the learner and reflect real-world understanding
- **Sufficient** – comprehensively address all learning outcomes
- **Transparent** – clearly structured and communicated
- **Appropriate** – aligned to the level and purpose of the qualification

Where necessary, assessments may be delivered under controlled conditions to maintain integrity and standardisation. Controlled assessment conditions may include:

- **Closed-book** settings, where access to reference materials is not permitted.
- **Time-bound** assessments with defined durations.
- **Invigilation** to maintain the integrity of the assessment process, in person or via secure online proctoring.

Coverage of Learning Outcomes and Assessment Criteria

All assessment materials must be clearly mapped to the specific Learning Outcomes (LOs) and Assessment Criteria (ACs) outlined in the unit specification. Each LO and AC must be:

- fully and sufficiently covered within the assessment.
- matched to an appropriate assessment method (e.g., MCQ for recall, written response for explanation).
- designed to allow learners the opportunity to demonstrate the depth and breadth of understanding required at Level 3.

[1] Ofqual Handbook: General Conditions of Recognition - Section E - Design and development of qualifications - Guidance - GOV.UK

Assessment must not omit or dilute any criteria. This ensures learners are fairly assessed against the full scope of the qualification requirements, supporting valid and reliable results.

Centre-Devised Tests and Examinations

Where centres design and administer multiple choice or written assessments, they must:

- maintain a sufficient, regularly updated bank of assessment materials:
    - For example, a 30-question MCQ test should draw from a large, validated item bank to ensure variation and integrity.
- identify and mitigate risks associated with assessments conducted under controlled conditions.
- deliver and manage assessments in accordance with SIAS' Examination and Invigilation Policy.

Choosing Suitable Assessment Methods

Assessment methods must be selected based on their suitability for the learning outcomes and qualification level. For example:

- **Multiple Choice Questions (MCQs):** Effective for testing factual recall.
- **Written Assessments**: Suitable for demonstrating explanation, description, or analysis.
- **Presentations and Professional Discussions:** Allow for exploration of ideas, clarification, and application of knowledge.

When selecting methods for assessing knowledge, centres must ensure that chosen approaches are appropriate to the qualification level and enable the learner to meet the assessment criteria. For example, multiple choice questions (MCQs) may be suitable for assessing factual recall but are generally not appropriate for higher-level qualifications or for assessment criteria requiring learners to *explain*, *describe*, *evaluate*, or *analyse*.

Assessments must enable learners to demonstrate both the breadth and depth of understanding required to meet all assessment criteria.

Centres are responsible for ensuring assessment decisions are valid and reliable, and that work submitted for assessment by learners is prepared and produced independently by learners and free of plagiarism.

Quality Assurance and Record-Keeping

Assessment decisions must be:

- valid and reliable.
- free from plagiarism or malpractice.

Centres are responsible for ensuring robust internal quality assurance procedures are in place. All learner evidence and related assessment documentation must be:

- retained for a minimum of three years.
- accessible to SIAS-appointed External Quality Assurers (EQAs) upon request.
- securely stored and protected in line with data protection requirements.

Centre Requirements

All SIAS centres must be approved by SIAS to deliver the qualification(s) they wish to offer. This is to ensure centres have the processes and resources in place to deliver the qualification(s). Further information can be found in the SIAS Centre Handbook.

When a centre applies to offer a qualification, they will need to provide evidence that they have sufficient resources and infrastructure in place for delivery of that qualification:

- evidence of staff competence and knowledge
- details of available resources

Centres are responsible for ensuring that their assessors and internal quality assurance staff are:

- occupationally competent and/or knowledgeable in the role they are carrying out
- have current experience of assessing or internal quality assuring as appropriate to the role they are carrying out
- have access to appropriate training and support
- are independent

Information regarding the induction and continuing professional development must be made available to SIAS by centres through the external quality assurance process.

Tutor/Trainer Requirements

The role of the tutor or trainer in a centre is pivotal in delivering effective education and skill development. They are responsible for designing and delivering engaging training sessions, tailoring content to meet learners' needs, and fostering an environment conducive to learning. Tutors and trainers assess and monitor student progress, provide constructive feedback, and support learners in achieving their goals. They also stay updated with industry standards and best practices to ensure that their teaching methods and materials remain relevant and effective.

Both tutor and assessor roles may be performed by the same person providing that the qualification requirements for both roles are met.

For the SIAS Level 3 Diploma in Understanding Healthcare Estates Engineering (Northern Ireland) tutors/trainers are required to demonstrate they:

- have relevant occupational knowledge and competence.

- hold a recognised education and training qualification or have equivalent training experience.
- have completed recent, relevant CPD activities for the subject area.

Evidence includes:

- CV and relevant occupational qualifications and experience
- Up-to-date CPD Record including certification from any courses attended

Assessor Requirements

The role of the assessor is to evaluate the knowledge and/or competence of learners against the standards and criteria established by SIAS. Assessors design, conduct, and mark assessments. They ensure the assessment process is fair, consistent, and transparent, maintaining detailed records of learners' progress and outcomes. Assessors also collaborate with Internal Quality Assurers (IQAs) to ensure the reliability and validity of the assessment process, contributing to the overall quality and integrity of the qualification.

Assessors must be occupationally knowledgeable, competent and familiar with the qualification unit(s) they are assessing.

Both tutor and assessor roles may be performed by the same person providing that the qualification requirements for both roles are met.

Assessors must be able to make valid, reliable and fair assessment decisions.

For the SIAS Level 3 Diploma in Understanding Healthcare Estates Engineering assessors are required to demonstrate they:

- have relevant occupational knowledge and competence.
- hold or are working towards a recognised assessor qualification or have equivalent assessing experience.
- have completed recent, relevant CPD activities for the subject area.

Evidence includes:

- CV and relevant occupational qualifications and experience
- Up-to-date CPD Record including certification from any courses attended

Internal Quality Assurance Requirements

SIAS requires that centres implement a strong system for the internal quality assurance of their assessment processes and training delivery. This internal quality assurance must be carried out by a suitably qualified individual who has not participated in the delivery or assessment of the qualification they are evaluating.

The role of the Internal Quality Assurer (IQA) is crucial in maintaining the standards and integrity of the qualification process. The IQA is responsible for monitoring and evaluating the assessment practices within a centre to ensure consistency, fairness, and compliance

with regulatory requirements. This includes observing assessment activities, reviewing assessor decisions, providing feedback and support to assessors, and ensuring that assessment records are accurate and complete. The IQA also plays a key role in continuous improvement by identifying areas for development and implementing strategies to enhance the quality of assessments, which upholds the credibility of the qualifications awarded and ensures that learners receive fair and valid assessments.

IQAs must have an understanding of the content, structure and assessment requirements for the qualification(s) they are internally quality assuring. SIAS recommends that IQAs are occupationally knowledgeable. Centres should provide IQAs with an induction to the qualifications they are responsible for quality assuring. Centres should additionally provide IQAs with access to ongoing training and updates relevant to the qualification(s).

For the SIAS Level 3 Diploma in Understanding Healthcare Estates Engineering IQAs are required to demonstrate they:

- hold or are working towards a recognised internal quality assurance qualification or have equivalent internal quality assurance experience.
- have completed recent, relevant CPD activities.

Evidence includes:

- CV and relevant occupational qualifications and experience.
- Up-to-date CPD record including certification from any courses attended.

Continuing Professional Development (CPD)

Centres are expected to support their staff, ensuring that their subject knowledge remains current and is up to date with best practice in delivery, assessment and quality assurance.

External Quality Assurance

External quality assurance will be undertaken by SIAS. Centres will be required to provide documentation and other evidence to support this process upon request. Please refer to our Centre Handbook for further details.

Equality and Diversity

Delivery of SIAS qualifications must comply with equality and diversity legislation. Learners should not experience any barriers to achievement in respect of:

- Age
- Disability
- Gender
- Gender reassignment
- Marriage and civil partnerships
- Pregnancy and maternity
- Race

- Religion and belief
- Sexual orientation

Reasonable Adjustments

All learners must be treated fairly and equally and be provided with every opportunity to achieve our qualification(s). For more information or guidance, please refer to the SIAS Reasonable Adjustments Policy available on our website.

Health and Safety

SIAS are committed to ensuring the safety and wellbeing of learners. Due to the nature of some of the sectors SIAS work in, there can be a high level of risk which we expect centres to manage effectively. Centres must take appropriate measures to assess and manage these risks and implement procedures so that qualifications are delivered safely, minimizing risks to learners and those involved in the assessment process as much as possible. Working environments must comply with all required health and safety standards.

Qualification Content

Unit 1: Principles of health, safety, and the environment within healthcare estates engineering

Unit Reference	K/651/4619	
Level	2	
Credit Value	3	
GLH	20	
Aim	This unit aims to provide learners working in/towards a healthcare estates maintenance/technician role with the knowledge required to work safely and comply with relevant legal and organisational health, safety and environmental requirements.	
Assessment Methodology	Multiple-choice question examination	
Learning Outcomes *The learner will:*	**Assessment Criteria** *The learner can:*	
1. Understand fundamental health and safety regulations, standards and guidance relevant to healthcare estates engineering.	1.1	Recognise key aspects of health and safety regulations in relation to healthcare estates engineering.
	1.2	Identify health and safety requirements in the clinical setting.
	1.3	Recognise the essential steps for conducting an effective risk assessment in the workplace.
	1.4	Identify health and safety warning signs and symbols commonly used in healthcare estates maintenance.
	1.5	Identify personal responsibilities to ensure compliance with health and safety regulations and requirements.
	1.6	Identify how to report health and safety concerns in the workplace.
2. Understand environmental regulations and requirements within healthcare estates engineering.	2.1	Identify key environmental regulations and requirements within healthcare estates engineering.
	2.2	Recognise environmental signs and notices.
	2.3	Recognise how environmental regulations are used in healthcare estates engineering.
	2.4	Identify own responsibilities in relation to complying with environmental policies and procedures.

Unit 2: Communication and teamwork within healthcare estates engineering

Unit Reference	R/651/4620	
Level	2	
Credit Value	3	
GLH	22	
Aim	This unit aims to provide learners working in/towards a healthcare estates maintenance/technician role with the knowledge to communicate effectively and professionally, and to be able to work within a team.	
Assessment Methodology	Multiple-choice question examination	
Learning Outcomes *The learner will:*	**Assessment Criteria** *The learner can:*	
1. Understand communication and teamwork within the workplace.	1.1	Recognise communication techniques used within the workplace including: • Verbal • Written • Electronic.
	1.2	Recognise barriers in communication.
	1.3	Identify ways to overcome barriers in communication.
	1.4	Identify engineering terminology used in healthcare estates.
	1.5	Identify the characteristics of an effective team.
	1.6	Identify own responsibilities when working as part of a team.
2. Understand the principles of equality, diversity, and inclusion in the workplace.	2.1	Define equality, diversity, and inclusion in the workplace.
	2.2	Identify different forms of discrimination and harassment.
	2.3	Recognise workplace responsibilities in respect of equality, diversity and inclusion.
	2.4	Identify protected characteristics in relation to equality, diversity and inclusion.
	2.5	Identify how to report instances of bullying or harassment in relation to self or others.
3. Understand the use of	3.1	Recognise the purpose of different information technology used within healthcare estates.

information technology within healthcare estates.	3.2	Identify work management systems used in the healthcare sector.

Unit 3: Understand the healthcare engineering sector

Unit Reference	T/651/4621	
Level	2	
Credit Value	6	
GLH	42	
Aim	This unit aims to provide learners working in/towards a healthcare estates maintenance/technician role with the underpinning knowledge of the healthcare engineering sector.	
Assessment Methodology	Multiple-choice question examination	
Learning Outcomes *The learner will:*	**Assessment Criteria** *The learner can:*	
1. Understand the engineering function in the healthcare sector.	1.1	Recognise the roles and duties within the engineering function in the healthcare sector.
	1.2	Identify different types of employers that work within the healthcare sector.
	1.3	Recognise the supply chain within the engineering function.
	1.4	Recognise the purpose of audits within the engineering function.
	1.5	Identify stakeholder requirements and priorities.
	1.6	Recognise why continuity of service is important to stakeholders.
	1.7	Recognise the principles of clinical governance.
	1.8	Recognise the benefits of clinical governance for patients and staff.
2. Understand technological development and innovation in the healthcare engineering sector.	2.1	Recognise examples of technological development and innovation in the healthcare engineering sector.
	2.2	Define the term Industry 4.0.
	2.3	Identify how IT networking is used in the healthcare engineering sector.
3. Understand engineering standards, regulations, statutory	3.1	Recognise standards and regulations relevant to the healthcare engineering sector, to include: • British and European (BS-EN) engineering standards • Engineering certification completion (e.g. Gas, electric and OFTEC).

certificates, and Standard Operating Procedures relevant to the healthcare engineering sector.	3.2	Identify what Standard Operating Procedures (SOPs) are.
	3.3	Recognise how SOPs are used in the healthcare engineering sector.
4. Understand healthcare engineering industry regulations and guidelines.	4.1	Identify the purpose of the Medicines and Healthcare Products Regulatory Agency (MHRA) Regulations.
	4.2	Recognise what Health Technical Memorandums (HTMs) are.
5. Understand the implications of working in a clinical environment.	5.1	Recognise the patient's journey.
	5.2	Recognise the importance of patient: • Safety • Dignity • Respect • Confidentiality.

Unit 4: Basic principles of healthcare estates maintenance

Unit Reference	Y/651/4622	
Level	2	
Credit Value	6	
GLH	44	
Aim	This unit aims to provide learners working in/towards a healthcare estates maintenance/technician role to develop the knowledge to carry out basic maintenance work, including maintaining their own competence.	
Assessment Methodology	Multiple-choice question examination	
Learning Outcomes *The learner will:*	**Assessment Criteria** *The learner can:*	
1. Understand installation, commissioning and decommissioning practices and techniques used within healthcare engineering.	1.1	Recognise engineering representations, drawings, and graphical information used in healthcare engineering.
	1.2	Identify installation practices and techniques used within healthcare engineering.
	1.3	Identify commissioning practices and techniques used in healthcare engineering.
	1.4	Identify decommissioning practices and techniques used in healthcare engineering.
2. Understand basic principles of engineering maintenance.	2.1	Recognise maintenance practices and techniques, to include: • Planned • Preventative • Predictive • Frequency • Reactive.
	2.2	Recognise fault finding and problem-solving techniques, to include: • Diagnostics • Troubleshooting • Testing for minor faults.
	2.3	Identify common causes of faults.
	2.4	Recognise repair practices and techniques.

3. Understand how to select, use and maintain machinery, tools and equipment required to perform engineering maintenance tasks.	3.1	Identify machinery, tools and equipment used to perform engineering maintenance tasks and their purpose.
	3.2	Recognise correct: • Use • Maintenance • Storage of tools, machinery and / or equipment to carry out engineering maintenance tasks.
4. Understand the different types of documentation and their requirements in the engineering healthcare sector.	4.1	Recognise engineering maintenance documentation methods.
	4.2	Identify data protection requirements relevant to engineering maintenance documentation.
	4.3	Recognise the purpose of information governance.
	4.4	Recognise why it is important to remove patient identifiable data from records.
	4.5	Identify the purpose of manufacturer's instructions and warranties.

Unit 5: Healthcare engineering and clinical environment management

Unit Reference	Y/651/7927	
Level	3	
Credit Value	3	
GLH	20	
Aim	This unit aims to equip learners with a comprehensive understanding of the multifaceted aspects of working within a clinical environment, specifically focusing on healthcare engineering. This includes the regulatory frameworks and standards that underpin healthcare engineering practices, enabling learners to effectively contribute to the maintenance and improvement of clinical environments.	
Assessment Methodology	Short answer question paper	
Learning Outcomes *The learner will:*	**Assessment Criteria** *The learner can:*	
1. Understand health and safety requirements and the limits of the technician role in healthcare estates.	1.1	Describe how key health and safety regulations and requirements are used within healthcare estates.
	1.2	Explain the limits of the technician role and the role of specialist contractors on medical gas systems.
2. Understand the principles of working in a clinical environment.	2.1	Summarise patient requirements when in the clinical environment.
	2.2	Explain requirements for use and sharing of confidential patient information within health and social care organisations.
	2.3	Explain the purpose of patient contact protocols.
	2.4	Explain the importance of following infection prevention and control procedures.
	2.5	Explain the impact of breaches of regulations, policy and procedures.
	3.1	Summarise the principles of data protection under GDPR.

3. Understand data protection and information governance as it applies to healthcare engineering.	3.2	Evaluate the consequences of non-compliance with data protection laws in the healthcare engineering context.
4. Understand the impact of financial constraints and service level agreements on healthcare engineering.	4.1	Identify common financial constraints in healthcare engineering.
	4.2	Assess the implications of financial constraints for project planning and resource allocation.
	4.3	Summarise the components and role of service level agreements (SLAs) in healthcare engineering.
	4.4	Assess the impact of service level agreements on service delivery.
	4.5	Explain the consequences of not meeting service level agreements.
5. Understand estates engineering industry regulations and guidelines.	5.1	Describe the purpose of Health Building Notes.
	5.2	Explain how the Premises Assurance Model (PAM) is used.
6. Understand engineering standards and regulations.	6.1	Identify the purpose of different engineering standards and regulations.
	6.2	Explain the importance of engineering standards and regulations as they apply to the healthcare estates technician role.
7. Understand key healthcare engineering industry regulations and guidelines.	7.1	Explain the purpose of the Medicines and Healthcare products Regulatory Agency regulations.
	7.2	Summarise the key principles of the Care Quality Commission regulations.

Unit 6: Understand engineering principles including mechanical, electrical and mechatronics

Unit Reference	A/651/7928	
Level	3	
Credit Value	5	
GLH	30	
Aim	To provide healthcare engineering technicians with foundational knowledge of mathematical, scientific, mechanical, electrical, mechatronic, and control systems principles, as well as energy consumption profiling. This unit aims to enhance understanding of the theoretical concepts that support effective engineering practices in healthcare environments.	
Assessment Methodology	Short answer question paper	
Learning Outcomes *The learner will:*	**Assessment Criteria** *The learner can:*	
1. Understand mathematical and scientific principles relevant to healthcare engineering.	1.1	Identify the appropriate methods used to calculate conversions.
	1.2	Identify how flow rates and pressures are calculated.
	1.3	Explain principles used when equipment sizing to ensure adequate performance and safety in healthcare applications.
	1.4	Explain the importance of flow rate calculations.
2. Understand mechanical principles relevant to healthcare engineering.	2.1	Summarise the mechanical principles relating to motion and mechanics, including types of motion in healthcare equipment.
	2.2	Explain how storage and transfer of forces and energy apply to healthcare systems.
	2.3	Summarise the role of mechanical motors and pumps in systems relevant to healthcare.
3. Understand the principles of mechatronics within healthcare engineering.	3.1	State ways in which mechatronics are used in healthcare settings.
	3.2	Describe key components of integrated mechanical and electrical systems.
	3.3	State design considerations for integrated mechanical and electrical systems.
	3.4	Describe how different integrated mechanical and electrical systems work within the healthcare setting.

4. Understand electrical and electronic principles relevant to healthcare engineering.	4.1	Summarise the principles of electricity and electronics.
	4.2	Explain fundamental electric circuit theory relevant to healthcare estates.
	4.3	Explain how series and parallel configurations are used in healthcare systems.
	4.4	Explain the principles that underpin the operation of electrical motors and pumps.
5. Understand control systems principles relevant to healthcare engineering.	5.1	Describe the principles of control systems used in healthcare engineering.
	5.2	Explain the application of different control systems in healthcare engineering.
	5.3	Explain why control systems are important in the healthcare sector.
6. Understand energy consumption and usage profiling.	6.1	Explain factors that impact on energy consumption.
	6.2	Describe strategies for reducing energy consumption.
	6.3	Explain different energy usage profiling techniques within healthcare estates.
	6.4	Explain the benefits of energy usage profiling.

Unit 7: Understand estates systems and supplies (water, gas, and electrical)

Unit Reference	D/651/7929	
Level	3	
Credit Value	9	
GLH	60	
Aim	To provide healthcare engineering technicians with a comprehensive understanding of the knowledge required for the installation, commissioning, maintenance, decommissioning, and operation of essential systems within healthcare estates. This unit covers theoretical aspects of system interconnections, maintenance strategies, and the impact on service continuity. The unit also contains common causes of faults and the techniques used to identify them.	
Assessment Methodology	Workbook	
Learning Outcomes *The learner will:*	**Assessment Criteria** *The learner can:*	
1. Understand installation, commissioning practices and techniques in healthcare engineering.	1.1	Summarise practices and techniques used to assemble, position and fix equipment and components.
	1.2	Describe key components of the commissioning process in healthcare engineering.
2. Understand decommissioning practices and techniques in healthcare engineering.	2.1	Summarise practices and techniques used to disconnect and remove equipment and components.
	2.2	Describe storage measures which may need to be taken to prevent deterioration.
	2.3	Explain how unwanted equipment is dealt with as part of the decommissioning process.
3. Understand maintenance practices and techniques used within engineering.	3.1	Describe circumstances when different maintenance practices and techniques should be applied, to include: • Planned • Preventative • Predictive

		• Reactive.
	3.2	Describe how the frequency of maintenance is determined.
4. Understand fault-finding and problem-solving techniques in healthcare engineering.	4.1	Describe different diagnostic tools used for identifying minor faults.
	4.2	Summarise troubleshooting processes to identify faults.
	4.3	Explain methods for testing electrical circuits and systems.
5. Understand common causes of faults, including component and system failures relevant in healthcare engineering.	5.1	Describe common issues and failure types in healthcare systems.
6. Understand repair practices and techniques.	6.1	Summarise practices and techniques to replace, fit and repair components to rectify faults.
7. Understand the purpose, operation, and interconnections of systems within healthcare estates and their impact on service continuity.	7.1	Identify the key systems within healthcare estates.
	7.2	Explain the purpose and role of key systems within healthcare estates.
	7.3	Explain the interconnections between systems within healthcare estates.
	7.4	Evaluate the impact of interconnections between systems on service continuity within healthcare estates.
8. Understand energy infrastructure for healthcare estates and system resilience.	8.1	Summarise site wide energy infrastructure for healthcare estates.
	8.2	Explain how energy infrastructure resilience can ensure continuity of service.

Unit 8: Understand machinery, tools and equipment and materials used in healthcare engineering

Unit Reference	J/651/7930	
Level	3	
Credit Value	6	
GLH	40	
Aim	To provide healthcare engineering technicians with essential knowledge on the use, maintenance, and storage of machinery and equipment, the requirements for calibration, and the properties of engineering materials, ensuring safe and efficient operations in healthcare environments.	
Assessment Methodology	Centre devised assessment	
Learning Outcomes *The learner will:*	**Assessment Criteria** *The learner can:*	
1. Understand the purpose, safe use and maintenance of machinery, tools, and equipment in healthcare engineering.	1.1	Describe the purpose and functions of machinery, tools, and equipment used in healthcare engineering.
	1.2	Explain the consequences of using incorrect equipment.
	1.3	Explain the importance of undertaking pre-checks of operating tools and equipment in line with manufacturer and employer requirements.
	1.4	Explain the safe usage practices and operational protocols for machinery and equipment.
	1.5	Describe requirements for storing and moving tools and equipment on completion of work.
	1.6	Outline maintenance requirements for healthcare engineering equipment.
2. Understand engineering materials used in the healthcare sector.	2.1	Identify engineering materials used in the healthcare sector.
	2.2	Summarise the properties of engineering materials used in the healthcare engineering.
	2.3	Explain how the properties of engineering materials impact on the use and longevity of healthcare equipment.
3. Understand the requirements for calibrated equipment.	3.1	Summarise the requirements for calibrated equipment.
	3.2	Evaluate the impact of uncalibrated equipment on healthcare outcomes.
	3.3	Explain the purpose of calibration certificates.

4. Understand stock and services considerations in healthcare engineering.	4.1	Summarise factors to be taken into account when maintaining stock and services.
	4.2	Explain how equipment and parts are identified.
	4.3	Explain the function and importance of parts, spares, and components in healthcare estates.
	4.4	Explain the processes for dealing with and returning faulty stock.
	4.5	Explain how parts to be removed can be salvaged.

Unit 9: Understand quality assurance and continuous improvement in engineering maintenance

Unit Reference	K/651/7931	
Level	3	
Credit Value	3	
GLH	15	
Aim	To develop healthcare engineering technicians' understanding of quality assurance and continuous improvement principles and practices to enhance the effectiveness, reliability, and safety of healthcare engineering operations.	
Assessment Methodology	Centre devised assessment	
Learning Outcomes *The learner will:*	**Assessment Criteria** *The learner can:*	
1. Understand quality assurance principles and practice relevant to healthcare engineering.	1.1	Explain quality assurance principles important to healthcare engineering.
	1.2	Identify methods for verifying equipment performance and reliability in healthcare facilities.
	1.3	Explain the purpose of compliance audits.
	1.4	Evaluate the impact of quality assurance on compliance with healthcare regulations.
	1.5	Explain techniques for applying quality assurance principles.
2. Understand continuous improvement principles and practices used in healthcare engineering.	2.1	Evaluate different continuous improvement methodologies used in healthcare engineering.
	2.2	Explain how continuous improvement practices can benefit the: • Organisation • Patient • Client • Work process.

Unit 10: Understand Engineering Maintenance Processes and Documentation for Healthcare Settings

Unit Reference	L/651/7932	
Level	3	
Credit Value	4	
GLH	25	
Aim	To equip healthcare engineering technicians with the knowledge and skills required to manage documentation, ensure compliance with industry standards, and understand the importance of manufacturers' instructions and statutory certificates within the healthcare estates sector.	
Assessment Methodology	Centre devised assessment	
Learning Outcomes *The learner will:*	**Assessment Criteria** *The learner can:*	
1. Understand how manufacturers' instructions and warranties support the safety, and use of, engineering equipment.	1.1	Explain the benefits of following manufacturer's instructions.
	1.2	Assess the potential impacts of warranties on healthcare engineering projects and equipment maintenance.
	1.3	Explain how warranties influence maintenance schedules and decision-making processes.
2. Understand statutory and best practice certificates and their role in healthcare engineering compliance.	2.1	Explain the types and purpose of statutory certificates, including: • Electricity certificates • Theatre validations • Safety.
	2.2	Explain the importance of statutory certificates in maintaining compliance with healthcare engineering regulations.
	2.3	Explain the impact of non-compliance with statutory certification.
3. Understand the requirements for documentation and record-keeping in	3.1	Describe types of documentation used in healthcare engineering and what they are used for.
	3.2	Compare the advantages and limitations of electronic documentation versus paper-based records.

healthcare engineering.	3.3	Summarise legal and regulatory requirements for record retention and accessibility in healthcare settings.
	3.4	Describe how documentation and records can be used to effectively plan, schedule and manage healthcare engineering activities.
	3.5	Explain data security measures and confidentiality considerations for both electronic and physical records.
	3.6	Outline the types and formats of reports used in healthcare engineering.
	3.7	Evaluate how consistent document formatting and version control help to avoid errors and maintain compliance.
	3.8	Describe how effective record-keeping practices help to maintain quality standards in healthcare engineering.
4. Know how to interpret engineering representations, drawings, and graphical information for healthcare applications.	4.1	Identify diagram types used within healthcare engineering.
	4.2	Identify key symbols, legends, and conventions used in healthcare engineering drawings.
	4.3	Identify scale and dimensions in technical drawings.
	4.4	Describe the steps to interpret graphical information to support installation, repair, or maintenance activities.
5. Understand how Health Technical Memorandums are used in healthcare estates engineering.	5.1	Summarise the purpose of Health Technical Memorandums (HTMs).
	5.2	Explain how Health Technical Memorandums (HTMs) are used as part of engineering activities.

Resources

SIAS provides the following additional resources for this qualification:

- Centre Qualification Guide
- Qualification Learner Achievement Record
- Sample Assessment Material
- Externally Set Assessments

Please see below examples of sample assessment questions:

Sample Question 1
Explain two requirements for the correct use and sharing of confidential patient information within health and social care.
Marking Guidance
1 mark for each of the following (or other suitable response) - Ensure that patient and sensitive information is kept secure. - Only access healthcare data when necessary for maintenance tasks. - Follow protocols for handling, storing, and disposing of patient information. - Abide by Caldicott principles. - Share information only with authorised personnel. - Complete training on data protection and confidentiality.

Sample Question 2
Describe two impacts of breaching regulations, policies, or procedures in a healthcare estates environment.
Marking Guidance
1 mark for each of the following (or other suitable response) - Breaching regulations or procedures can lead to unsafe conditions that jeopardise patient safety. - Breaches can result in legal penalties, fines, or enforcement actions from regulatory bodies. - A breach can harm the reputation of the healthcare organisation, reducing trust among patients, staff, and stakeholders. - Breaches can lead to disruptions in healthcare services, impacting the day-to-day functioning of the facility. - Breaches may result in significant financial costs, such as fines, legal fees, or the expense of rectifying non-compliance issues.

- Breaches can negatively affect staff morale and patient confidence in the quality of care provided.
- A minor breach that is not addressed can escalate into a more serious issue, causing widespread problems.

Further Information

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