Skills Development Scotland

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SAAB Scottish Apprenticeship Advisory Board

TECHNICAL APPRENTICESHIP IN DIGITAL TECHNOLOGY

Overview

This apprenticeship is designed to support the development of apprentices working in digital technology, who will develop skills, knowledge and techniques relative to their chosen specialist pathway. The five pathways are;

Software Development, Cyber Security, Data Analytics, IT Support, Network Infrastructure and Cloud Infrastructure.

The goal of the apprenticeship is to develop competence in the use of existing, evolving and emerging digital technologies and to enable apprentices to develop and apply practice and principles within their specialist pathway of choice.

Duration

We expect this apprenticeship to take 12-24 months to complete depending on the specialist pathway.

Level

SCQF Level 8. More information on SCQF can be found **here**.

Qualification achieved

Apprentices will achieve **one** of the following qualifications:

Diploma in Digital Technology: Software Development at SCQF Level 8 (GT91 48))

Diploma in Digital Technology: Cyber Security at SCQF Level 8 (GT8Y 48)

Diploma in Digital Technology: Data Analytics at SCQF Level 8 (GT90 48)

Diploma in Digital Technology: IT Support at SCQF Level 8 (GV2K 48)

Diploma in Digital Technology: Network Infrastructure at SCQF Level 8 (GV2H 48)

Diploma in Digital Technology: Cloud Infrastructure at SCQF Level 8 (GV2J 48)

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INTRODUCTION

Apprenticeships aim to provide a mixture of on-the-job (in the workplace) and off-the-job (through day or block release) learning to enable people to develop the knowledge, skills and expertise required by businesses today.

Designed by employers to attract new talent, tackle critical skills shortages and develop existing workforces, apprenticeships can both help people to enter the world of work and develop the skills of those already in work

About Scottish Apprenticeships

Scottish Apprenticeships are for everyone and reflect the Government's commitment to promoting a world-class, inclusive, work-based learning system. They are administered by **Skills Development Scotland,** the National Skills Agency. Skills Development Scotland has a remit to contribute to the nation's economic growth and it does this by supporting individuals and businesses alike to develop and apply their skills in the workplace.

The Scottish Apprenticeship system focuses on three specific key elements:

- the **learning outcomes** aligned to the specific work situations of an apprentice's job;
- the **knowledge, skills and behaviours** that will be developed by apprentices, enabling them to work competently and confidently;

  and
- the **meta-skills** that will be developed by apprentices to help them to manage themselves, collaborate with others and interact with change.

Throughout their apprenticeship, apprentices will be supported and guided by their employer, mentor and learning provider, and will have their growing competence measured by an assessor to ensure they can perform their job to the standard required. On successful completion, apprentices will be awarded nationally recognised competence-based and/or professional qualifications in their chosen field.

About this standard and framework document

Working in partnership with businesses and stakeholders, this standard and framework document has been written to provide apprentices and employers with an overview of the key features of this apprenticeship. Please read this alongside the associated occupation profiles for Software Development, Cyber Security, Data Analytics, IT Support, Network Infrastructure and Cloud Infrastructure.

Find further information on apprenticeships here!

Digital Technology Pathways

This apprenticeship is designed to support technician level Digital Technology roles adopted across different sectors and contains 6 incorporated specialist pathways for software development, cyber security, data analytics, IT support, network infrastructure and cloud infrastructure.

Each pathway will provide apprentices with the skills and knowledge required to become competent in their chosen job role and includes a balance of technical, business and interpersonal skills areas, designed to ensure apprentices have an appropriate set of skills to operate in today's digital job roles.

Digital Technology
Technical Apprenticeship
SCQF Level 8

- Software Development
- Cyber Security
- Data Analytics
- IT Support
- Network Infrastructure
- Cloud Infrastructure

Click on the specialist pathway you would like to learn more about!

Role of the apprentice

This apprenticeship has been designed for use to support digital technology roles in software development both within digital organisations and also across different sectors such as construction, engineering, utilities, infrastructure, finance and a variety of public bodies.

There are a number of software development roles available across these sectors e.g. software developer, software engineer, software tester, software architect and software designer. These roles cover the design, development, coding, testing and implementation of high-quality software solutions for use in a variety of platforms (application, web, mobile, mainframe etc.). They apply engineering principles to the full software development life cycle and ensure security robustness is built in.

Apprentices will be expected to achieve the following learning outcomes by the end of their apprenticeship:

- Adopt and adapt software development lifecycle models selecting appropriately from plan-driven approaches or adaptive iterative/agile approaches in line with organisational requirements
- Design appropriate software solutions using contemporary approaches that deliver business value and meet customer requirements
- Plan, design, execute and report on software tests using appropriate testing tools and techniques and conforming to agreed organisational standards
- Plan, create and document new and amended software components to deliver agreed requirements to stakeholders
- Plan, create, design and develop user documentation for new and amended software components

The following **learning outcomes** are mandatory and common to all six specialist pathways:

- Identify, evaluate and prioritise the opportunities to apply digital technology to improve operations by transforming business processes
- Use project management tools to plan, organise and monitor the progress of activities to achieve production quality performance indicators
- Develop meta-skills and personal professionalism through reflective practice, goal setting and active learning to improve own performance in line with organisational requirements.

Knowledge, skills and behaviours

This apprenticeship is designed to develop apprentices' careers by developing their knowledge and understanding of their role, by increasing their skills and by enhancing their behaviours.

Employers from a variety of sectors have helped to identify the key knowledge, skills and behaviours that apprentices working in digital technology need to develop. Throughout their apprenticeship, apprentices should be regularly assessed to ensure they can demonstrate both know-how and ability in their chosen pathway; a high-level summary is provided below under each pathway.

A full list of the **knowledge, skills and behaviours** can be found in the Occupation Profile for Software Development:

Knowledge

- How to design test cases and test data
- How to create and document detailed designs for software applications
- Industry standard software and web design and accessibility frameworks and guidelines
- Approaches to organising software development
- How to develop user stories that document the user view of a software product.

Skills

- Reviewing requirements and defining test conditions
- Designing software components and specifying user interfaces
- Coding, verifying, testing documenting, amending, and refactoring software
- Adapting software design and development methods
- Drafting and maintaining documentation for software applications design.

Behaviours

- Complying with relevant legislation, internal and external industry standards
- Working effectively in teams to develop software solutions.

The following **knowledge, skills and behaviours** are common to all specialist pathways:

Knowledge

- Different methodologies to plan and deliver activities
- The purpose and importance of meta-skills

Skills

- Applying methods and principles of project management
- Reflecting on and learning from practice

Behaviours

- Acting on feedback to develop own skills and knowledge

Role of the apprentice

This apprenticeship has been designed for use to support digital technology roles in cyber security both within digital organisations and also across different sectors such as construction, engineering, utilities, infrastructure, finance and a variety of public bodies.

There are a number of cyber security roles available across these sectors e.g. cyber security analyst, cyber security engineer, intrusion analyst, threat analyst and cyber security architect. These roles cover the need to identify threats, monitor networks and systems to identify anomalies and detect new security incidents and provide incident response. This also includes the analysis and assessment of vulnerabilities in digital infrastructure (software, hardware, networks), and recommending countermeasures to re-mediate new vulnerabilities.

Apprentices will be expected to achieve the following **learning outcomes** by the end of their apprenticeship:

- Identify the risks to data in an organisation and conduct risk assessments to qualify and manage them in line with the organisation's policies and risk appetite
- Identify and investigate suspicious activities and take appropriate actions to remediate threats in line with organisational policies
- Detect and deal with cyber and data security incidents in line with the organisation's incident management process
- Check and confirm the organisation's security complies with legal and regulatory requirements.

In addition, apprentices may have the opportunity to achieve one or more of the following **optional outcomes**:

- Identify, analyse and aggregate threat data to provide trusted actionable intelligence to inform strategic decision-making
- Test the security of systems to identify vulnerabilities or potential exploits of critical systems and sensitive data through conducting vulnerability assessments and penetration testing
- Implement security controls in response to threat and vulnerability analysis to maintain security within the organisations level of risk appetite
- Secure the scene, investigate and capture evidence maintaining evidential weight and analysing evidence to identify breaches of policy, regulation or law in line with procedures.

The following **learning outcomes** are mandatory and common to all six specialist pathways:

- Identify, evaluate and prioritise the opportunities to apply digital technology to improve operations by transforming business processes
- Use project management tools to plan, organise and monitor the progress of activities to achieve production quality performance indicators
- Develop meta-skills and personal professionalism through reflective practice, goal setting and active learning to improve own performance in line with organisational requirements.

Knowledge, skills and behaviours

A full list of the **knowledge, skills and behaviours** can be found in the Occupation Profile for Cyber Security

Knowledge

- Key properties used in information security when considering risk
- The role of intrusion detection systems and alarms
- The threat landscape including current and emerging trends
- Principles and methodologies for conducting threat intelligence gathering and analysis
- Main processes for managing the security of information systems
- Processes, procedures, and tools used to recover and preserve digital evidence

Skills

- Contributing to providing risk assessments
- Monitoring network and system activity to detect and identify potential intrusion
- Contributing to the scoping and conduct of vulnerability assessments
- Verifying information, processes and systems meet security criteria
- Undertaking forensic tasks
- Acting as a first responder to incidents
- Assessing and validating information

Behaviours

- Adhering to legal, regulatory, compliance and standards
- Operating effectively within teams
- Following the legal and regulatory requirements

The following **knowledge, skills and behaviours** are common to all specialist pathways:

Knowledge

- Different methodologies to plan and deliver activities
- The purpose and importance of meta-skills

Skills

- Applying methods and principles of project management
- Reflecting on and learning from practice

Behaviours

- Acting on feedback to develop own skills and knowledge

Role of the apprentice

This apprenticeship has been designed for use to support digital technology roles in data analytics both within digital organisations and also across different sectors such as construction, engineering, utilities, infrastructure, finance and a variety of public bodies.

There are a number of data analytics roles available across these sectors e.g. data manager, data engineer, data analyst and data scientist. These roles cover the need to create and maintain data models and databases, source clean and process data for analysis, analyse data to reveal trends and patterns and validate hypotheses, visualise and communicate the results of analysis to provide new insights.

Apprentices will be expected to achieve the following **learning outcomes** by the end of their apprenticeship:

- Manage data assets through the definition and secure use and storage of data to support data analysis
- Identify and clarify business problems reformulating them into data problems in line with organisational requirements
- Locate data sources for analysis in line with data governance procedures
- Prepare data for analysis providing data quality assessment in line with industry standards
- Perform statistical analysis of data to identify trends and uncover patterns in unstructured and semi-structured data
- Present, communicate and disseminate outputs to audiences with high impact through creative storytelling
- Identify and use an appropriate range of tools to support and automate data tasks including data extraction, transformation, analysis, and visualisation.

In addition, apprentices may have the opportunity to achieve the following **additional outcome**:

- Apply machine learning models using appropriate techniques for problems.

The following **learning outcomes** are mandatory and common to all six specialist pathways:

- Identify, evaluate and prioritise the opportunities to apply digital technology to improve operations by transforming business processes
- Use project management tools to plan, organise and monitor the progress of activities to achieve production quality performance indicators
- Develop meta-skills and personal professionalism through reflective practice, goal setting and active learning to improve own performance in line with organisational requirements.

Knowledge, skills and behaviours

A full list of the **knowledge, skills and behaviours** can be found in the Occupation Profile for Data Analytics.

Knowledge

- How to design data visualisations to meet requirements
- How to critically analyse, interpret and evaluate complex information from diverse datasets
- How to train and validate machine learning models
- Data sources, how they are collected, where and how they are stored
- How to design, build and manage databases to store and manage data
- How to select the data analysis methods to be used
- The range of common data quality issues that can arise

Skills

- Identifying appropriate visualisation tools to present and communicate insights
- Applying data analytics on data to discover new trends, patterns, and relationships.
- Using available data sets and business problems to select machine learning algorithms
- Monitoring network and system activity to detect and identify potential intrusion
- Contributing to scoping and conducting vulnerability assessments and penetration testing
- Assessing and validating information on security threats
- Contributing to providing risk assessments
- Verifying relevance and accessibility of potential data sources
- Using modern digital data management methods
- Planning activities to deliver data analysis solutions
- Performing data quality assessments and conducting data quality verification

Behaviours

- Communicating in line with audience requirements
- Using data ethically
- Developing and maintaining collaborative relationships
- Complying with legal and regulatory requirements

The following **knowledge, skills and behaviours** are common to all specialist pathways:

Knowledge

- Different methodologies to plan and deliver activities
- The purpose and importance of meta-skills

Skills

- Applying methods and principles of project management
- Reflecting on and learning from practice

Behaviours

- Acting on feedback to develop own skills and knowledge

Role of the apprentice

This apprenticeship has been designed for use to support digital technology roles in IT support both within digital organisations and also across different sectors such as construction, engineering, utilities, infrastructure, finance and a variety of public bodies.

There are a number of IT support roles available across these sectors e.g. senior service desk technician, IT helpdesk analyst, senior IT helpdesk engineer. These roles cover the need to to resolve complex support requests with computer hardware, software and network systems.

Apprentices will be expected to achieve the following **learning outcomes** by the end of their apprenticeship:

- Respond to service requests for digital technology support by providing information to fulfil requests or enable resolution
- Implement and maintain service level management procedures to meet organisational requirements for service support delivery
- Provide asset management activities for managing the full life cycle of assets in line with organisational processes.

In addition, apprentices may have the opportunity to achieve one of the following **optional outcomes**:

- Create and test scripts to automate command sequences and repetitive tasks.
- Produce regular reports and metrics to update stakeholders on service management performance.

The following **learning outcomes** are mandatory and common to all six specialist pathways:

- Identify, evaluate and prioritise the opportunities to apply digital technology to improve operations by transforming business processes
- Use project management tools to plan, organise and monitor the progress of activities to achieve production quality performance indicators
- Develop meta-skills and personal professionalism through reflective practice, goal setting and active learning to improve own performance in line with organisational requirements.

Knowledge, skills and behaviours

A full list of the **knowledge, skills and behaviours** can be found in the Occupation Profile for IT Support.

Knowledge

- Steps involved in triaging service requests and how to apply them
- How to locate and identify service support procedures
- How to create and maintain an accurate asset register
- Main features of automation scripts
- Key performance indicators for service management

Skills

- Identifying systemic issue trends using analytical tools
- Creating and updating first-line support procedures
- Creating and maintaining accurate asset registers
- Creating automation scripts
- Monitoring service delivery performance

Behaviours

- Adhering to legal, regulatory, compliance and standards
- Responding to service requests in a timely manner

The following **knowledge, skills and behaviours** are common to all specialist pathways:

Knowledge

- Different methodologies to plan and deliver activities
- The purpose and importance of meta-skills

Skills

- Applying methods and principles of project management
- Reflecting on and learning from practice

Behaviours

- Acting on feedback to develop own skills and knowledge

Role of the apprentice

This apprenticeship has been designed for use to support digital technology roles in network infrastructure both within digital organisations and also across different sectors such as construction, engineering, utilities, infrastructure, finance and a variety of public bodies.

There are a number of network infrastructure roles available across these sectors e.g. infrastructure engineer, network specialist, infrastructure specialist, network administrator, infrastructure analyst, senior infrastructure engineer, network lead, senior infrastructure analyst. These roles support the design, build, deployment, evaluation, and maintenance of IT network infrastructure ensuring all IT systems function efficiently and seamlessly.

Apprentices will be expected to achieve the following **learning outcomes** by the end of their apprenticeship:

- Design, implement and test on-premises network solutions to provide network services
- Implement technical network security solutions to prevent, detect and monitor unauthorised access and compromise of network and network-accessible resources

The following **learning outcomes** are mandatory and common to all six specialist pathways:

- Identify, evaluate and prioritise the opportunities to apply digital technology to improve operations by transforming business processes
- Use project management tools to plan, organise and monitor the progress of activities to achieve production quality performance indicators
- Develop meta-skills and personal professionalism through reflective practice, goal setting and active learning to improve own performance in line with organisational requirements.

Knowledge, skills and behaviours

A full list of the **knowledge, skills and behaviours** can be found in the Occupation Profile for Network Infrastructure.

Knowledge

- Characteristics of hierarchical network design
- The main features of hardware and software firewalls

Skills

- Configuring routing and switching equipment
- Running network trials to evaluate hardware and software security

Behaviours

- Complying with relevant legislation, internal and external industry standards
- Operating effectively in teams

The following **knowledge, skills and behaviours** are common to all specialist pathways:

Knowledge

- Different methodologies to plan and deliver activities
- The purpose and importance of meta-skills

Skills

- Applying methods and principles of project management
- Reflecting on and learning from practice

Behaviours

- Acting on feedback to develop own skills and knowledge

Role of the apprentice

This apprenticeship has been designed for use to support digital technology roles in cloud infrastructure both within digital organisations and also across different sectors such as construction, engineering, utilities, infrastructure, finance and a variety of public bodies.

There are a number of cloud infrastructure roles available across these sectors e.g. cloud infrastructure engineer, cloud infrastructure architect. These roles are responsible for designing, monitoring and troubleshooting the organisation's infrastructure, cloud services, network and infrastructure security

Apprentices will be expected to achieve the following **learning outcomes** by the end of their apprenticeship:

- Build and manage cloud applications in virtualised and cloud environments in line with organisational requirements
- Implement cloud security to protect cloud environments, applications and data against internal and external cybersecurity threats

The following **learning outcomes** are mandatory and common to all six specialist pathways:

- Identify, evaluate and prioritise the opportunities to apply digital technology to improve operations by transforming business processes
- Use project management tools to plan, organise and monitor the progress of activities to achieve production quality performance indicators
- Develop meta-skills and personal professionalism through reflective practice, goal setting and active learning to improve own performance in line with organisational requirements.

Knowledge, skills and behaviours

A full list of the **knowledge, skills and behaviours** can be found in the Occupation Profile for Cloud Infrastructure.

Knowledge

- Cloud deployment service models
- How to perform security reviews of cloud-based network configuration deployments

Skills

- Setting up cloud storage to support cloud applications
- Configuring and updating security alerts across cloud platforms

Behaviours

- Complying with relevant legislation, internal and external industry standards
- Developing and maintaining collaborative relationships

The following **knowledge, skills and behaviours** are common to all specialist pathways:

Knowledge

- Different methodologies to plan and deliver activities
- The purpose and importance of meta-skills

Skills

- Applying methods and principles of project management
- Reflecting on and learning from practice

Behaviours

- Acting on feedback to develop own skills and knowledge

DEFINING META-SKILLS

Meta-skills sit alongside and complement technical knowledge, skills and behaviours. As technology, society and the way we work change at an ever-increasing pace, so meta-skills are the over-arching and future-focused attributes that enable other skills to be developed through consideration, reflection and implementation.

Meta-skills support improved performance and productivity, greater adaptability and resilience to change. For apprentices, meta-skills are a critical asset, supporting their ability to cope and excel in the face of change, to solve problems, to collaborate with others and to create successful futures. There are three categories, each with four meta-skills.

Managing yourself - focus, integrity, adaptability and initiative

Connecting with others - communication, feeling, collaboration and leadership

Interacting with change - curiosity, creativity, sense-making and critical thinking

Developing meta-skills in Digital Technology

Supported by their employer, mentor and learning provider, apprentices should consider, practise and reflect on their use of meta-skills during their apprenticeship, building those skills to enhance their personal effectiveness in their present role and their future careers.

Managing yourself

A clear **focus** is required when creating code, programming and analysing data; **integrity** is essential when learning from mistakes and ensuring customer needs are met; **adaptability** is key when switching between tasks and projects; and using **initiative** is critical to problem solving and progressing activity with limited supervision.

Connecting with others

Communication is crucial in keeping stakeholders informed of progress and asking the right questions; **feeling** is needed to show empathy and be respectful of others; skills in **collaboration** are vital when working on complex technical projects in cross functional teams; and strong **leadership** qualities will help to set a good example, take ownership and share common understanding.

Interacting with change

A keen sense of **curiosity** is a critical asset when asking questions and in using trial and error to explore alternative solutions; **creativity** is fundamental in thinking outside of the box and communicating complex ideas simply; **sense-making** comes into play when avoiding buzz words and sharing technical data with non technical clients; and **critical thinking** is key in building requirements for new deployments and in using logic to solve issues.

ROLES AND RESPONSIBILITIES

A number of different parties will be involved in the delivery, management and assessment of a successful apprenticeship. As well as the apprentice, key roles include employer, mentor, learning provider and assessor. Each has a specific set of responsibilities during the apprenticeship.

Apprentice Responsibilities

In their day-to-day roles, apprentices have the same responsibilities to their employer as any other employee but they have additional and specific responsibilities for their own learning and development too.

- Agreeing a learning/ development plan with all parties involved and following it through
- Committing to learning throughout the duration of apprenticeship
- Participating in progress meetings with employer and learning provider representatives
- Participating in off-the-job learning where required
- Reflecting on performance and on development of skills, knowledge and behaviours required of the role
- Agreeing new goals to progress learning with all parties involved

Employer Responsibilities

- Providing apprentices with a contract of employment, a job description and an induction Programmee
- Paying apprentices in line with company policy, current legislation, fair work principles, and equality and diversity expectations
- Ensuring a working environment that is free from discrimination, bullying and harassment
- Agreeing learning needs and a learning and development plan with the learning provider and apprentices including
    - agreeing when off-the-job learning will be required and releasing apprentices for this as required
    - making on-the-job learning arrangements
    - identifying additional support requirements and agreeing actions to implement these
- Providing a quality work-based learning environment for apprentices, including the facilities and training necessary to demonstrate competence and succeed in the apprenticeship
- Providing the support of a mentor, who has relevant industry experience and is familiar with the employer's business, to support apprentices' development
- Contributing to the ongoing assessment of occupational competence, including observing performance, verifying evidence and profiling meta-skills
- Meeting with apprentices and learning providers to review apprentices' progress and set future goals
- Providing an environment that supports apprentices to take responsibility for their own learning and development
- Supporting and encouraging apprentices during their apprenticeship
- Recognising the achievements of apprentices in career management and progression
- Providing constructive feedback to the learning provider on the quality of their service delivery to inform continuous improvement of both the Scottish Apprenticeships system and apprentices themselves

ROLES AND RESPONSIBILITIES

Mentor Responsibilities

- Helping new apprentices orientate into the workplace
- Providing information, advice and guidance relating to the learning and assessment aspects of the apprenticeship
- Supporting apprentices to define meta-skills in their shared work context
- Working with apprentices, employers and learning providers to ensure problems are resolved quickly
- Acting as an expert witness for apprentices
- Providing support to apprentices as they adjust to the workplace and progress in their career

Learning Provider Responsibilities

- Providing an appropriate apprenticeship programme for apprentices and employers
- Agreeing the learning needs of the apprentices with both the apprentice and the employer
- Agreeing when off-the-job learning will be required and defining roles and responsibilities for this with relevant parties
- Ensuring apprentices have access to the best quality learning opportunities available
- Ensuring apprentices and employers fully understand the principles and processes of competence-based assessment
- Registering apprentices through MA Online and with relevant awarding bodies, sector skills organisations and Skills Development Scotland as appropriate
- Compiling and agreeing learning and development plans and assessment plans with apprentices and employers
- Completing assessment records and submitting records and evidence for verification/moderation
- Reviewing apprentices' progress at regular intervals with the employer
- Supporting apprentices to develop their reflective practice
- Advising apprentices who to approach for support, advice and encouragement both within and outwith the workplace
- Seeking and providing feedback from and to employers and apprentices to inform continuous improvement of the Scottish Apprenticeships system and apprentices themselves

Assessor Responsibilities

- Meeting with apprentices, mentors and employers to plan learning and review progress
- Monitoring apprentices' progress against learning and development plans
- Observing and assessing apprentices in the workplace and judging whether their work meets the competence requirements set by the qualification awarding body
- Assessing different types of evidence from apprentices
- Providing constructive feedback on performance and offering suggestions for improvement
- Maintaining current knowledge of industry standards and seeking innovative new methods of work-based learning delivery

BEFORE THE APPRENTICESHIP STARTS

The recruitment of apprentices is primarily the responsibility of the employer and before an apprenticeship starts, consideration by the employer should be given to entry requirements and also to ensuring that the workplace adheres to fair work, inclusion and diversity principles.

The recommended entry requirements for this apprenticeship are:

- The minimum age for entry to this apprenticeship is 16
- Entry requirements should include as a minimum possession of qualification(s) at SCQF Level 6 or equivalent
- Candidates will need to demonstrate that they have the numeracy skills required to meet the learning outcomes.

However, employers can also consider existing workplace skills and experiences, where apprentices are either changing careers or upskilling. Being open to alternative assessment methods and relevant experience, instead of qualifications, can help to broaden the pool of potential applicants.

Recognition of Prior Learning

Individuals applying for an apprenticeship will undergo selection based on the employer's existing HR processes. Learning providers should take account of this and liaise with employers to provide advice and guidance on any RPL and experience that will be accepted for entry onto the programme.

It is recommended that a flexible approach to RPL is adopted, on a case-by-case basis, with all relevant experience as well as any previous qualifications considered. Learning providers should always consider how they can best recognise apprentices' prior learning to minimise repetition of content.

You can find more information on RPL **here**.

Apprenticeship agreement and employment status

All post-school apprentices must hold a contract of employment for the period of the apprenticeship.

In addition, an apprenticeship agreement, confirming the commitment of the employer, the apprentice and the learning provider to the agreed standard and framework (this document) must be signed by all parties. This agreement forms part of the individual employment arrangements between the apprentice and the employer; and of the learning arrangements between the learning provider, the employer and the apprentice.

Registration and certification

Registration and certification of apprenticeships is undertaken through Modern Apprenticeship Online.

It is the responsibility of the learning provider to ensure that the registration of apprentices is completed within four weeks of the start of their apprenticeship.

Fair work, inclusion and diversity

The Scottish Apprenticeships system aims to embed fair work principles. Fair Work First is the Scottish Government's flagship policy for driving high quality and fair work across the labour market in Scotland by applying fair work criteria to grants, other funding and contracts being awarded by and across the public sector, where it is relevant to do so. Through this approach the Scottish Government is asking employers to adopt fair working practices, specifically:

- appropriate channels for effective voice, such as trade union recognition;
- investment in workforce development;
- no inappropriate use of zero hours contracts;
- action to tackle the gender pay gap and create a more diverse and inclusive workplace; and
- payment of the real Living Wage.

Further guidance on Fair Work First is available from https://www.gov.scot/publications/fair-work-first-guidance-support-implementation/

The design and development of Scottish Apprenticeships aims to embed these principles in practical ways by including opportunities for feedback from apprentices as well as the availability of clear pathways into future opportunities beyond the apprenticeship itself.

Protected characteristics

The Equality Act 2010 includes nine protected characteristics, which are age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, and sex and sexual orientation. It is against the law to discriminate based on these protected characteristics. Skills Development Scotland is a Corporate Parent and, to that end, includes 'care experienced' in a similar way to protected characteristics in all its funded programmes and services.

Attracting the best people into apprenticeships involves ensuring that barriers are removed. Receiving the right support at the right time unlocks the potential of people who could otherwise be denied the opportunity to go on and become valued employees. Supporting people to feel confident about disclosing their protected characteristics in a safe and respectful way allows employers and learning providers to put the right conditions in place to unlock that potential; the right time for this is often at the start of an apprenticeship or even at the recruitment stage. In practice, it might involve ensuring that reasonable adjustments are made to accommodate apprentices, where that is possible and to help them make the most of their apprenticeship journey. Examples might include (but are not limited to) supporting people with sensory impairments, supporting people for whom English is not their first language and supporting people who are care experienced (for example, through fostering, adoption or residential care).

Diversity in Digital Technology

Evidence shows that women tend to be under-represented within the technology sector, although this can vary by job role. Guidance on good practice in attracting and retaining women within technology roles can be found in the Tackling the Technology Gender Gap Together report. We also know that some groups are more likely to face barriers to employment, for example, disabled people, care experienced people, people from ethnic minority groups, and/or people with caring responsibilities. In particular, there has been research into the benefits of recruiting a neurodivergent workforce within Digital Technology. Recruitment and delivery of this framework should take into account the need to be flexible and adapt to support the different needs of learners. These guides contain practical steps to make your recruitment more inclusive.

Once the apprenticeship starts, there are a number of key considerations, tasks and milestones that apprentices, employers, learning providers, mentors and assessors should undertake to optimise a successful outcome for all parties.

Work-based Learning

Work-based learning – aligned to and assessed against both the **learning outcomes** and the **knowledge**, **skills and behaviours** of the apprenticeship – is the central and most significant component of an apprenticeship and is based on apprentices' real-life experiences in the workplace. Work-based learning is a partnership between apprentice, employer and learning provider and all apprentices must have the support of a mentor in the workplace.

Get more information on work-based learning **here.**

Meta-skills Development

This apprenticeship includes a **work situation** that provides opportunities to develop **meta-skills**. To effectively develop the meta-skills outlined earlier, apprentices must first understand what they are and how they might apply them in their role. To help with this, a simple exercise to define what meta-skills mean in their role (in language that both apprentice and employer are comfortable with) should be used. This will allow apprentices to consider their own meta-skills profile and which meta-skills they might need to develop or apply in order to perform effectively at work.

Setting development goals, action planning and regularly reflecting on progress will help apprentices to develop their meta-skills and it is vital to provide the time and space for reflections to take place. Naturally occurring opportunities to discuss and reflect on meta-skills might include inductions or performance management, career development and performance review sessions.

Delivery of Training

The majority of training undertaken in any apprenticeship is focused on skills developed in the workplace. However, in some apprenticeships there is a requirement for elements of structured formal taught learning/training to be delivered outside the normal workplace, for example, in a college or training centre which might include classroom and or development of skills in a workshop/ realistic work environment. We often describe this as "off-the-job" training. The way this is delivered is an individual negotiation between the learning provider and the employer.

There is no mandatory requirement for off-the-job formal taught learning in this apprenticeship, however, some employers may choose to deliver elements of training in a college or training centre to enhance the quality of the learning experience for their apprentices.

An initial assessment and learning plan should be developed at the outset with input from the apprentice, employer and the learning provider, to identify any additional needs and provide apprentices with the appropriate support or adaptations required to successfully complete their apprenticeship.

Approaches to Assessment

Apprentices are expected to provide evidence of meeting the **learning outcomes** and the **knowledge, skills and behaviours** required of this apprenticeship; also, evidence to demonstrate that they are competent in the workplace. It is important for apprentices to recognise how they have developed skills and understanding along the way, and where these still need to be developed.

Assessment methods	Software Development	Cyber Security	Data Analytics	IT Support	Network Infrastructure	Cloud Infrastructure
Cross organisation projects			✓	✓	✓	✓
Case Studies			✓	✓	✓	✓
Professional discussion	✓	✓	✓	✓	✓	✓
Portfolio of evidence	✓	✓	✓	✓	✓	✓
Problem based learning	✓	✓	✓	✓	✓	✓
Presentations	✓	✓	✓	✓	✓	✓
Security testing and digital forensic analysis		✓		✓	✓	✓
Realistic simulation via scenarios/ questionnaires		✓		✓	✓	✓
Gamification		✓		✓	✓	✓
Capture the flag exercises		✓		✓	✓	✓

Holistic Assessment
The holistic approach allows larger pieces of work to evidence a number of **learning outcomes,** rather than a piecemeal process of finding separate evidence for each outcome and/or its associated **knowledge, skills and behaviours**. **Work-based projects** or **problem-based activities** often provide the richest opportunities for holistic assessment. Assessment of the common learning outcomes will be done in parallel with assessment of technical skills. Assessment should be undertaken both in a controlled environment and through work related activity depending on what is being assessed, however most assessment should take place in the workplace.

Quality assurance

Skills Development Scotland is responsible for making sure all funded learning is of high quality and benefits the apprentice. A quality assurance framework is in place to cover the delivery of work-based learning in an apprenticeship and is designed to demonstrate how effectively learning providers and employers support this by ensuring apprentices:

- Receive appropriate support and guidance to enable them to become successful apprentices and confident individuals;
- Receive quality learning and develop their skills to achieve their learning goals;
- Are treated with dignity and respect in a way that promotes equality and inclusion; and
- Work towards successful outcomes, leading to future employment or further appropriate career progression.

The relevant awarding and accreditation bodies will undertake the quality assurance of the assessment of competence-based and professional qualifications.

Qualification Requirements

Through their apprenticeship, apprentices must complete **one** chosen specialist pathway from the competence-based qualifications shown below. These qualifications brings together the development and assessment of all the **learning outcomes** and **knowledge, skills and behaviours** required of the role in three specialist pathways, and they include meta-skills development and assessment, which are integrated with technical skills.

Diploma in Digital Technology: Software Development at SCQF Level 8 (GT91 48

Diploma in Digital Technology: Cyber Security at SCQF Level 8 (GT8Y 48

Diploma in Digital Technology: Data Analytics at SCQF Level 8 (GT90 48)

Diploma in Digital Technology: IT Support at SCQF Level 8 (GV2K 48)

Diploma in Digital Technology: Network Infrastructure at SCQF Level 8 (GV2H 48)

Diploma in Digital Technology: Cloud Infrastructure at SCQF Level 8 (GV2J 48)

Core Skills

Core Skills are broad transferrable skills, which can be used in addition to meta-skills, to help apprentices learn how to manage and adapt how they respond to a changing society.

The five Core Skills are: Communication, Numeracy, Information and Communication Technology, Problem Solving and Working with Others,

Core Skills are not a requirement of this framework

Pathways and Progression

A successfully completed apprenticeship, including the achievement of a competence-based qualification, opens the door to a number of opportunities for progression in both work and further learning.

Career advancement

Successful apprentices may progress to roles such as software developer, senior information security analyst, cyber security engineer, data analyst or data scientist.

Further study

There are several options for those wishing to pursue further professional learning and development in an appropriate specialist pathway, these include:

Graduate apprenticeships

- Graduate Apprenticeship in Cyber Security
- Graduate Apprenticeship in Data Science
- Graduate Apprenticeship in IT: Software Development
- Graduate Apprenticeship in IT: Management for Business

Undergraduate programmes

Successful apprentices may progress to undergraduate study in Software Development, Cyber Security, Data Science, Computer Networking or Cloud Computing.

Professional Registration

This apprenticeship may support professional recognition as it includes learning and skills outcomes common to a number of the introductory professional qualifications relevant to the Digital Technology sector. The apprentice, employer and learning provider will determine the most appropriate professional route in light of the apprentice's specific work role and the learning provider will guide each successful apprentice on the professional registration process they should follow.

AMENDMENTS

HOME

Version Number	Date	Description
v1	October 2022	Framework live after AAG approval
v2	July 2023	Three additional pathways approved by AAG and added to framework