

Graduate Apprenticeships

Framework document for

IT: Management for Business

SCQF level 10

April, 2017



European Union



gov.scot

EUROPE & SCOTLAND

European Social Fund

Investing in a Smart, Sustainable and Inclusive Future

Document control

Version history

Version	Revision(s)	Approved by	Date
1.0	Full template	WBL PB	15.09.16
2.0	Revisions	TEG members	20.04.17
Final	Final	TEG members	25.04.17
3.0	Higher Apprenticeship reference	SDS	01.07.19

Terms and abbreviations

Term	Meaning
SDS	Skills Development Scotland
GA(s)	Graduate Apprenticeship(s) / Apprentice(s)
SCQF	Scottish Credit and Qualifications Framework
TEG	Technical Expert Group
QA	Quality Assurance
ITMB	IT: Management for Business
BSc	Bachelor of Science
IT	Information Technology
UKSPEC	UK Standard for Professional Competence
IEng	Incorporated Engineer
CEng	Chartered Engineer
ICT	Information and Communication Technology
CPU	Computer Processing Unit
I/O	Input/output

IT: Management for Business (SCQF level 10)

If you need any further information, please contact: GAmbx@sds.co.uk

Contents

1. Graduate Apprenticeships in Scotland	5
1.1 Purpose of the Graduate Apprenticeship framework document	5
1.2 What are Graduate Apprenticeships?	5
1.3 Why do we need Graduate Apprenticeships in Scotland?	5
1.4 Who develops Graduate Apprenticeships?	6
1.5 Who are Graduate Apprenticeships for?	6
1.6 Who delivers Graduate Apprenticeships?	6
2. Delivery.....	6
3. Roles and responsibilities	8
3.1 Role of the employer.....	8
3.2 Role of the learning provider	8
3.3 Content delivery and assessment	9
4. Entry	9
4.1 Eligibility.....	9
4.2 Recognition of prior learning	10
5. Demand	10
6. The framework.....	12
6.1 Overview.....	12
6.2 Purpose	12
6.3 Occupational outcomes	13
6.4 Learning outcomes	13
6.5 Professional recognition.....	13
6.6 Related Scottish apprenticeship frameworks	14
Appendix A. Learning and Skills Outcomes	15
Appendix B. Low-level outcomes examples	17
Appendix C. Framework development summary	27

1. Graduate Apprenticeships in Scotland

1.1 Purpose of the Graduate Apprenticeship framework document

The purpose of this document is to provide employers and learning providers with information required to deliver a Graduate Apprenticeship in **IT: Management for Business**. The framework sets out the skills and learning outcomes identified through employer consultation that are required to support the development of this programme.

This framework document should be read in conjunction with the following publications:

1. Work-based Learning Principles
2. Product Specification at **SCQF level 10**
3. Quality Assurance Guidance

This documentation is available on the Skills Development Scotland (SDS) corporate website: www.skillsdevelopmentscotland.co.uk

1.2 What are Graduate Apprenticeships?

Graduate Apprenticeships (GAs):

- are accredited work-based learning programmes that lead to degrees or degree-level, professionally recognised qualifications
- are part of the apprenticeship family, supporting the transition into employment by providing work-based learning pathways from Foundation and Modern Apprenticeships to Higher and Graduate Apprenticeships, at SCQF Levels 8 –11
- have been developed as part of the Scottish Government's approach to developing Scotland's young workforce and Skills Development Scotland's work-based learning strategy

1.3 Why do we need Graduate Apprenticeships in Scotland?

International experience demonstrates how degree-level apprenticeships can drive economic growth. We believe this approach can benefit the Scottish economy.

The range of approaches taken in countries including Switzerland and Germany to develop employer-led, work-based learning pathways to learning and employment provide the basis for how Scotland can use work-based learning to improve the operation of the labour market and to deliver economic growth¹. Skills Development Scotland is now leveraging the development of Graduate Apprenticeships to support this change.

¹ PWC (2015) Young Workforce' Index: How well are OECD economies developing the economic potential of their young people?

1.4 Who develops Graduate Apprenticeships?

Graduate Apprenticeships are developed by Skills Development Scotland through consultation with employers, universities, professional bodies and qualification authorities in the form of Technical Expert Groups (TEGs). The TEGs act as advisory groups on behalf of the sector and are based on the current and future skills needs of industry. They advise on the topics and related outcomes that should be included in a framework.

More information about who was involved in the development of this framework can be found in [Appendix C](#).

1.5 Who are Graduate Apprenticeships for?

Graduate Apprenticeships provide a new way into degree-level study for individuals who are either currently in employment or are entering into employment. GAs are available to employees aged 16 or over.

1.6 Who delivers Graduate Apprenticeships?

Graduate Apprenticeships are delivered by universities in partnership with employers and college learning providers. An up-to-date list of learning providers and the frameworks they offer can be found on www.apprenticeships.scot.

2. Delivery

As Graduate Apprentices are work-based degrees, the place of employment is the place of learning. The learning and skills development must be fully integrated into both the **delivery and assessment** of the degrees when part of a Graduate Apprenticeship. This integration can only be satisfactorily achieved by proper planning and design prior to delivery and not by add-on components or ad-hoc modifications.

The authenticity of the programme is shown in the way employers are involved in the design and delivery of the degrees and the way in which work-based learning is positioned as integral to both the learning and the assessment needed for successful completion of the programmes.

GA are designed as full-time programmes. They are not part-time or sandwich courses. Attendance at the place of learning will be agreed between the provider and the employer sending individuals on the programmes. Examples of how this might work are:

- by day release or
- by block release of three or four-week duration, three times per year
- through distance learning with an initial “boot camp or induction”

Fundamentally, most of an individual’s time should be spent in the workplace on directed study.

In designing the degrees to meet the work-based learning requirements of the GA, learning providers must ensure that they also meet the principles and criteria noted here:

Box 1. Principles and criteria

This GA is an **SCQF level 10** work-based degree. All proposed university degree programmes for this GA framework must:

- be **480 credits**
- be based on a partnership between employers and the learning provider
- evidence how the programmes exemplify the work-based learning requirements
- have clear goals and aspirations in support of equality and diversity with appropriate monitoring and other processes in place
- demonstrate how they will ensure that apprentices, upon graduation, will consistently achieve the necessary industry skills, knowledge and competence defined in **Appendix A**
- develop learning through reflection and review of work processes and experience
- meet the requirements to apply for professional body recognition

NB Delivery models based on sandwich years or industrial placement block release are not considered as work-based learning as part of this framework.

The successful delivery of Graduate Apprenticeships depends upon an effective partnership between the apprentice, the employer and the learning provider. This will involve additions to their normal responsibilities for employees, learning providers, and apprentices.

Delivery of the content of the GA will be agreed by the participating learning providers, which may involve delivery of specialist or employer-specific content. Employers should also be closely involved with all aspects of the programme, including the course specification, delivery, and assessment of practical activities.

The learning provider has responsibility for the quality assurance and enhancement of all elements of the programmes, but they must adhere to the SDS specified documents referenced in **Section 1** and any additional guidance documentation provided as part of their competitive grant award. Practical activities must make use of the work environment and course content must take account of the technologies used in the apprentice's employment.

Apprentices must have individual learning and training plans. The learning provider and existing employer HR systems should be co-ordinated during the development of the individual learning and training plan to ensure that the required employer contextualisation is effective. Even within a specific employer, there may be apprentices who use differing technologies.

3. Roles and responsibilities

3.1 Role of the employer

Apprentices are employees and subject to the standard terms and conditions applying to all employees.

Employers participating in the Graduate Apprenticeship programme must:

- consider whether a candidate has a reasonable chance of achieving the chosen programme during the selection process – this includes not only the course content but the acquisition of wider graduate attributes
- provide agreed information to support the candidate's application to the degree course
- provide apprentices with suitable opportunities to gain the experience in the workplace that will support their learning and skills acquisition
- provide each apprentice with a nominated mentor who must be readily accessible to the apprentice and to the learning provider
- liaise with the learning provider on the content and practical activities in the apprentice's individual learning and training plan
- provide information that will support the individual apprentice and their assessment

3.2 Role of the learning provider

Apprentices are both employed by the employer, as well as enrolled with the learning provider. As such they should have access to the same facilities as any other student.

GA course design and delivery must adhere to the principles detailed in preceding sections and in addition the learning provider must:

- adopt a flexible approach to considering the suitability of candidates by taking account of the portfolio of previous learning and experience an individual brings to the programme – this will include any relevant Foundation or Modern Apprenticeship undertaken – and support best practice in assessing individuals and in gathering evidence from employers where this is required
- liaise with the employer on the content and practical activities in the apprentice's individual learning plan

In addition, the learning provider should liaise with existing employer Training and Development and Quality Assurance (QA) systems to minimise double assessment. Development and meaningful implementation of individual learning plans is an essential component of the GA and assessments should take account of existing evidence wherever possible.

New evidence that directly relates to the workplace may be authenticated by employers or the individual's mentor.

IT: Management for Business (SCQF level 10)

There are a range of different delivery mechanisms, but the integration of knowledge within contextualised learning opportunities must be the overriding factor.

3.3 Content delivery and assessment

Content delivery and assessment responsibilities:

	<i>Employer</i>	<i>Learning Provider</i>	<i>Other</i>
<i>Delivery of knowledge and understanding content</i>	✓ Employer specific topics	✓ Generic and non-employer specific	✓ Private providers
<i>Assessment of practical application</i>	✓	✓	✓ Apprentice
<i>Development of personal and business skills</i>	✓ Specification, delivery, progress monitoring, assessment and mentoring	✓ Specification, delivery, progress monitoring and assessment	✓ May be a third party used for delivery, monitoring and assessment

4. Entry

4.1 Eligibility

- Graduate Apprenticeships are available to new and existing employees of participating employers.
- Candidates must be at least 16 years of age. However, the suitability of an individual for entry onto a GA will be decided by the employer and their learning provider partner.
- Candidates must be resident in Scotland throughout the Graduate Apprenticeship. In addition to this, their employer's working premises must also be located in Scotland. When applying to become a Graduate Apprentice the individual will be required to satisfy the employer that they have the right to live and work in the UK.
- Entry requirements are likely to vary across learning providers. For courses where there is a mandatory requirement for a specific subject, learning providers should consider ways they can provide support to individuals who don't hold a traditional qualification but have nevertheless shown aptitude and competence at the necessary level.

4.2 Recognition of prior learning

Candidates will undergo a selection process for a Graduate Apprenticeship, based on employer HR processes. The admissions departments need to take account of this and liaise with employers to provide advice and guidance on the prior learning and experience that will be accepted for entry onto the course.

A more flexible approach to entry requirements should be adopted by learning providers and be done in consultation with employers. This should involve consideration of candidates on a case by case basis, who have completed relevant Foundation, Modern or Technical Apprenticeships as well as industry / vendor certifications.

Universities and other providers are asked to consider ways they can optimise the apprentice's prior learning within the programme to ensure there is no unnecessary repetition of content.

5. Demand

This sector covers both the manufacture of hardware including computers, consumer electronics and telecommunication equipment and the development and publishing of software, web sites and data management activities. This is a fast-paced sector where new job roles and competencies evolve quickly.

Employment²

In 2017, **employment in the sector was 62,200** accounting for two per cent of all employment in Scotland. This makes it **one of the smallest Key Sectors in Scotland** measured by employment. Since the recession in 2008 employment in the sector has grown by 13 per cent, compared to a one per cent decline for all industries. More recently (since 2015) employment has declined by two per cent, compared to no growth across all industries. This suggests that despite being a relatively small key sector in terms of employment, it has been a source of jobs growth since the recession although recently there have been job losses.

The highest levels of employment were in Edinburgh, East and Midlothian (15,100) and Glasgow (12,600). There was a high concentration in West Lothian where employment in the sector was more than three times the national average. Employment in the sector was also above average in Fife, Edinburgh, East and Midlothian and the West Region. This suggests that although nationally the sector is small, there are a number of regions mostly in the central belt where the sector is an important source of jobs. Typically, rural factors and logistics have been barriers in the sector; however, technological developments are reducing the limitations of location and geography. Continued improvements in broadband and connectivity infrastructure will increase opportunities across Scotland.

The recent employment decline in the sector is not forecast to continue. By 2020, employment in the sector will have increased by 1,400, an increase of two per cent. The

² Oxford Economics Regional and Sectoral Forecast (2000-27)

growth is expected to continue over the longer term up to 2027, growing by seven per cent. This is more than double the rate of growth than all industries, which are expected to grow by three per cent. Growth will create jobs in the sector and the need to replace workers will also generate demand. **Based on employment in 2017, six per cent of the workforce will need to be replaced by 2027. The sector's net requirement for workers up to 2027 will be 8,000.** This is one per cent of the net requirement for workers across all industries.

In line with current employment, the greatest proportion of the total net requirements for workers in Digital Technologies sector will be located in Edinburgh, East and Midlothian (30 per cent); and Glasgow (20 per cent).

Occupations³

In 2017, the majority (66 per cent) of the Digital Technologies workforce were in higher level occupations. The proportion of the workforce in mid and lower level occupations was lower, 17 per cent each. In 2027 there will be a small change in the occupational structure of the workforce with two per cent more of the workforce being in higher level occupations and one per cent fewer in both mid and lower level occupations.

Graduates are most in demand by employers of technology staff, and those with technology, science and maths disciplines are most sought after. However, 31% of graduates in technology roles do not have a computer science degree, representing the importance of transferable skills and aptitude and the willingness of employers to consider a range of career and learning pathways.⁴

Digital and Technology Occupations in Other Sectors⁵

Digital growth is no longer just consigned to Digital Technology companies as technology is now transforming and underpinning many sectors. Consequently, there is increased demand for highly skilled individuals with technology skills to support the businesses. For example, the increasing importance of technology within Financial Services has led to the emergence of the sub-sector, Fintech, the amalgamation of Digital Technologies and Financial Services.

In 2016, **90,000 people were employed in technology roles across all sectors in Scotland**; 60 per cent of these were in non-technology sectors. Technology occupations increased by 10 per cent from 2015 to 2016 and are forecast to continue to grow. Forecast demand, accounting for new and replacement demand, estimates **12,800 annual vacancies for technology roles in Scotland.**

The number of technology professionals employed in other sectors is growing faster than for technology businesses, further illustrating the demand for technology skills across all industries. This growth represents a significant opportunity for young people and other new

³ Oxford Economics Regional and Sectoral Forecast (2000-27)

⁴ Digital Scotland 'Scotland's Digital Technologies Summary Report 2017' in conjunction with SDS, EKOSgen, and Oxford Economics

⁵ Digital Scotland 'Scotland's Digital Technologies Summary Report 2017' in conjunction with SDS, EKOSgen, and Oxford Economics

IT: Management for Business (SCQF level 10)

entrants, but also means it is important that employers have a buoyant talent pipeline to support these vacancies.

Digital and ICT Skills Investment Plan

The Digital and ICT Skills Investment Plan (SIP) developed in 2014 identifies actions to support the growth ambitions of the sector. GAs could support a number of these actions including broadening the future talent pipeline for Digital Technology skills.

New Developments Influencing Demand for GAs

The Scottish Government awarded SDS additional funding for cyber security careers events focusing on Work Based Learning (WBL) opportunities – as part of this, SDS has also committed to running industry events to raise awareness of GAs among employers (as well as MAs and FAs).

6. The framework

6.1 Overview

The **IT: Management for Business (ITMB)** Graduate Apprenticeship is based on industry defined needs and has been developed in collaboration with employers and the education sector to allow knowledge, understanding, skills and competence to be developed with the necessary attributes industry expects from its graduates.

Within the **ITMB** Graduate Apprenticeship, the degree content must be delivered per the principles and outcomes detailed in this framework.

The specific Graduate Apprenticeship included in this framework is:

- **IT: Management for Business (ITMB)**

The output of this framework will be a Graduate Apprenticeship at **SCQF level 10** entitled:

Graduate Apprenticeship in BSc (Hons) IT: Management for Business

6.2 Purpose

The aim of the Graduate Apprenticeship in **IT: Management for Business** is to produce graduates with a common core of skills and knowledge who can:

- a broad background of business operations, procedures and culture applicable to a career in IT in a business environment
- sufficient technical knowledge to play a key role in an IT related environment
- personal and interpersonal skills enabling them to work closely and communicate with employees in non-IT related areas of an organisation
- a set of problem-solving and modelling skills appropriate to IT related business operations
- sufficient management and business knowledge to play a management role in an IT project

IT: Management for Business (SCQF level 10)

- project delivery experience in a business-oriented environment

A key part of the **IT: Management for Business** framework is that each of the four key content areas is combined to deliver a holistic learning experience:

- 20-25% Business
- 25-35% Technology
- 20-25% Personal and Interpersonal Skills
- 20-25% Project Management

Details of the high-level learning and skills outcomes for these content areas are provided in **Appendix A** along with some examples of low level learning outcomes in **Appendix B**.

6.3 Occupational outcomes

The IT: Management for Business GA is aimed at employment in the following areas:

- IT Consultancy
- IT System Operation
- IT System Management
- IT Network Planning and Control
- IT Project Management

6.4 Learning outcomes

Please refer to **Appendix A** and **B** for a full list of learning outcomes for the **IT: Management for Business** GA.

6.5 Professional recognition

The ITMB GA framework supports the achievement of professional recognition as relevant to the degree specified. The achievement of a degree as part of a GA, including the professional experience gained, and the completion of the work-based project, will provide the evidence of recognised accomplishment and acceptance as a full and professional practitioner in the IT industry through IEng recognition.

The UK Standard for Professional Competence (UKSPEC) sets out the competence and commitment required for registration as an Incorporated Engineer (IEng). The degrees that have been designed to be used within the **IT: Management for Business** GA include the range of learning and skills outcomes that demonstrate the required competence and commitment to achieve Incorporated Engineer (IEng) recognition. A candidate on completion of a GA will also be on course to demonstrate the requirements for Chartered Engineer (CEng) in the future.

6.6 Related Scottish apprenticeship frameworks

The following Scottish Apprenticeship frameworks and qualifications are relevant pathways that may contribute toward progression into the **IT: Management for Business** GA. The apprenticeships are eligible for funding contributions from Skills Development Scotland, and provide individuals and employers with a range of alternative pathways at different levels of entry:

In school:

- Foundation Apprenticeship in ICT and Digital (SCQF level 6)

[FA ICT and Digital SCQF 6](#)

Post-school:

- Modern Apprenticeship in Information Technology (SCQF level 6)

[MA Information Technology SCQF L6](#)

- Technical Apprenticeship in Data Analytics (SCQF level 8)

[Technical Apprenticeship in Data Analytics SCQF L8](#)

- Modern Apprenticeships in IT and Telecommunications (SCQF levels 5)

[MA IT and Telecommunications SCQF L5](#)

- Technical Apprenticeship in Information Security (SCQF level 8)

[Technical Apprenticeship Information Security SCQF8](#)

- Technical Apprenticeship in IT and Telecommunications (SCQF level 8)

[Technical Apprenticeship IT and Telecommunications SCQF L8](#)

Appendix A. Learning and Skills Outcomes

FRAMEWORK: IT: Management for Business (SCQF level 10)

This section details the high-level learning and skills outcomes for the GA in **ITMB** that must be covered within the degree. **Appendix B** provides suggested low-level outcomes that may be covered within each section.

This presents a broad set of outcomes against which universities can position their intended provision to meet the high-level learning outcomes and flavour the programme for their intended employer audience.

Topics and high-level learning and skills outcomes:

Learning and skills outcomes for IT: Management for Business
1. Business
1.1. Business functions, behaviours, ethics, and courtesies
1.2. Business strategy and management
1.3. Business finance and accounting
1.4. Information systems management
1.5. Bidding and business development
1.6. Information security
2. Technology
2.1. Information systems
2.2. Data
2.3. Systems analysis and design
2.4. Software development and programming
2.5. Computer and network infrastructure
2.6. Information systems operations and change
3. Personal and interpersonal
3.1. Communications
3.2. Personal attributes
3.3. Professional attributes
3.4. Team working
4. Software project and delivery management
4.1. Project management methodologies

IT: Management for Business (SCQF level 10)

4.2. Project planning
4.3. Project execution
4.4. Agile project delivery
4.5. Risk assessment and management

Appendix B. Low-level outcomes examples

The next section provides examples of low level learning and skills outcomes which employers may expect individuals to cover in a Graduate Apprenticeship **IT: Management for Business** degree.

The low-level learning and skills outcomes are not intended to be used as a pro-forma curriculum.

Each learning provider will have their own approach to delivering the degree and progression between stages. The low-level skills and derived learning outcomes that are detailed in the following sections will provide guidance to ensure that each degree covers the desired learning outcomes appropriately.

Table 1 Skills and knowledge coverage in business

1. Business
1.1. Business functions, behaviours, ethics, and courtesies
1.2. Business strategy and management
1.3. Business finance and accounting
1.4. Information systems management
1.5. Bidding and business development
1.6. Information security

1.1. Business behaviours, ethics and courtesies

- ITMB1.1.a. Have demonstrated that they have understood and mastered basic business behaviour, ethics and courtesies, demonstrating timeliness and focus when faced with distractions and the ability to complete tasks to a deadline with high quality
- ITMB1.1.b. Have demonstrated an understanding of basic business functions and own employer's organisational structure and that of its senior leadership team
- ITMB1.1.c. Have gained an understanding of and be able to demonstrate competence in time management
- ITMB1.1.d. Be able to apply basic management considerations: prioritisation, task versus responsibility management, managing up and across the organisation, people considerations
- ITMB1.1.e. Understand employment relations issues and the application of policies and procedures for managing these relationships, and the application of good practice relating to equality and diversity issues in the workplace

1.2. Business strategy and management

- ITMB1.2.a. Understand own employer's business objectives and strategy and its position in the market and how own employer adds value to its clients through the services and/or products it provides
- ITMB1.2.b. Gain an appreciation of the strategic importance of data analytics for business decision making
- ITMB1.2.c. Gain an appreciation of the strategic importance of business processes and demonstrated an ability to document and understand them
- ITMB1.2.d. Understand the principles of business transformation by being able to decompose and abstract a non-obvious business problem, structure it, collect relevant information, consider options and make recommendations
- ITMB1.2.e. Gain an understanding of and be able to demonstrate competence in quality management.
- ITMB1.2.f. Gain an understanding of and be able to demonstrate competence in systems thinking, flow charting, type and frequency data analysis and modelling future flows.

1.3. Business finance and accounting

- ITMB1.3.a. Demonstrate a range of financial accounting skills to include: discounted cash flows, net present values, paybacks, rates of return, basic balance sheet and income statements and the assessment and mitigation of risk management information
- ITMB1.3.b. Negotiate and agree the final activity/project budget with those with decision-making responsibility, subsequently monitoring and controlling performance, identifying and remediating any significant variances, and obtaining agreement from those with decision-making responsibility, if required
- ITMB1.3.c. Understand how to justify the value of technology investments and apply benefits management
- ITMB1.3.d. Formulate a well-reasoned investment proposal and construct a basic business investment case for a new technology solution, including estimation of both costs and benefits using quantitative methods

1.4. Information systems management

- ITMB1.4.a. Understand the business impact of information technology in different sectors, including an international dimension. Recognise contemporary working practices and social media; covering work in the office, home, on the move and in both global and virtual environments
- ITMB1.4.b. Gain an understanding of and be able to demonstrate competence in gathering business requirements
- ITMB1.4.c. Understand the stages through which digital business services are created; from discovery, through to live, and understand how those services can be maintained and managed over time until they are retired
- ITMB1.4.d. Understand why effective commercial management, including (where necessary) information systems procurement, is important in delivering high quality services that improve continuously

1.5. Bidding and business development

- ITMB1.5.a. Identify new business opportunities or contracts and work with internal stakeholders to develop partnership working
- ITMB1.5.b. Analyse the client or tender documents to ensure the bid replies being created respond implicitly to the questions being asked.
- ITMB1.5.c. Draft and review bid submission content, ensuring all bids are submitted on time and fully compliant with the requirements.
- ITMB1.5.d. Understand how to undertake bid coordination and preparation

1.6. Information security

- ITMB1.6.a. Be able to conduct a security risk assessment for a defined business context that includes documenting what information is at risk, the type and level of risk realised; and the impact of the risk being realised
- ITMB1.6.b. Understand that information is an organisational asset that has utility and a value which may be relative depending on the perspective taken. Recognise that it has attributes relating to confidentiality, possession, integrity, authenticity and availability, any of which can make it vulnerable to attack
- ITMB1.6.c. Understand that business information is vulnerable to threats from systems and people
- ITMB1.6.d. Understand the difference between threat, risk, attack and vulnerability. Be able to describe typical threats, attacks and exploits and the motivations behind them

Table 2 Skills and knowledge coverage in technology

2. Technology
2.1. Information systems
2.2. Data
2.3. Systems analysis and design
2.4. Software development programming
2.5. Computer and network infrastructure
2.6. Information systems operations and change

2.1. Information systems

- ITMB2.1.a. Critically analyse a business domain to identify the role of information systems. Highlight issues and identify opportunities for improvement through evaluating information systems in relation to their intended purpose and effectiveness
- ITMB2.1.b. Have an appreciation and understanding of the current and future technical landscape environment, including potential factors to consider when selecting technologies for business solutions and rapid change of technology
- ITMB2.1.c. Appreciate the role of legacy systems and that business needs can integrate new digital front-end solutions with legacy back-end systems

2.2. Data

- ITMB2.2.a. Model data solutions using conceptual data modelling and visualisation techniques
- ITMB2.2.b. Demonstrate competence in database design
- ITMB2.2.c. Implement a database solution using industry standard database technologies
- ITMB2.2.d. Demonstrate competence in data collection and data analysis by applying quantitative analytical techniques to make business recommendations

2.3. Software systems analysis and design

- ITMB2.3.a. Gained an understanding of software requirements engineering and management and be able to demonstrate competence in software requirements engineering techniques (elicitation, prioritisation, etc.)
- ITMB2.3.b. Analyse business and technical requirements by selecting and specifying appropriate technology solutions

IT: Management for Business (SCQF level 10)

- ITMB2.3.c. Understand the key steps in a design process and where security considerations should be designed. Design appropriate technology solutions for business problems using industry standard techniques, including user centred design principles and user stories
- ITMB2.3.d. Understand the fundamental principles of software architectures and different approaches to software systems provision including mobile and web applications and distributed (Cloud) computing systems

2.4. Software development and programming

- ITMB2.4.a. Have gained competence in Programming in at least one contemporary language and understand the application of multiple programming paradigms using, for example, .Net, Java and open source solutions e.g. Python
- ITMB2.4.b. Appreciate the different approaches to software development and the shift from traditional methods of delivery to more agile methods
- ITMB2.4.c. Understand how the design process must start with identifying real user needs. Determine user needs and measure how successfully they are met
- ITMB2.4.d. Realise that Software Testing embraces the planning, design, management, execution and reporting of tests. Implement software testing using appropriate tools and techniques and conforming to agreed process standards and industry specific regulations
- ITMB2.4.e. Understand what is meant by software configuration management and version control at a software component/function level, and configuration of a software release
- ITMB2.4.f. Comprehend the organisational context into which software is deployed and the human and business issues associated with deployment and user training needs
- ITMB2.4.g. Understand the concepts of defensive programming (including input checking) and testing to build secure and resilient systems that are fit for purpose

2.5. Computer and network infrastructure

- ITMB2.5.a. Understand the function and role of a typical computer architecture (CPU, memory, disk, I/O)
- ITMB2.5.b. Identify the key characteristics of a network service and develop estimates of the expected traffic intensity and traffic load that the network must support in the business
- ITMB2.5.c. Plan and design a simple network to a requirement specification that includes hubs, switches, routers and wireless user devices

IT: Management for Business (SCQF level 10)

ITMB2.5.d. Gain an understanding of the principles of network management

ITMB2.5.e. Identify and evaluate network security risks and incorporate appropriate security products and processes into network designs to increase security, resilience and dependability

2.6. Information systems operations and change

ITMB2.6.a. Gain an understanding of change control principles related to information systems

ITMB2.6.b. Gain an understanding of information systems operations principles (hardware and software) and be able to demonstrate competence in managing, operating and maintaining information systems using, for example, ITIL

Table 3 Skills and knowledge coverage in personal and interpersonal

3. Personal and interpersonal	
3.1.	Communications
3.2.	Personal attributes
3.3.	Professional attributes
3.4.	Team working

3.1. Communications

- ITMB3.1.a. Identify the purpose of the communication, the audience and the outcomes to be achieved. Decide which method of communication to use and the level of formality required
- ITMB3.1.b. Make concise, engaging and well-structured verbal presentations, arguments and explanations of varying lengths, with and without the use of media, always considering the audience viewpoint
- ITMB3.1.c. Competent in active listening appreciating others views and contributions
- ITMB3.1.d. Give and receive feedback by constructively applying appropriate techniques and incorporate it into his/her own development and life-long learning
- ITMB3.1.e. Effectively prepare and deliver presentations using relevant presentation media products such as PowerPoint, Prezi etc., and the use of appropriate visualisations and images to present information and ideas clearly and convincingly
- ITMB3.1.f. Be fluent in written communications with the ability to articulate complex issues, selecting an appropriate structure and with appropriate tone, style and language
- ITMB3.1.g. Be competent at selling, questioning, negotiating and closing techniques in a range of interactions and engagements, both with internal and external stakeholders

3.2. Personal attributes

- ITMB3.2.a. Be creative, self-motivated, self-aware and able to reflect on successes and failures in ways that strengthen positive attitude and develop self-reliance through an understanding of their own personal preferences, styles, strengths and weaknesses
- ITMB3.2.b. Identify the preferences, motivations, strengths and limitations of other people and apply these insights to work more effectively with and to motivate others
- ITMB3.2.c. Understand the outputs from and apply insights to using personal profiling tools such as Myers Briggs Type Indicator, or Kirton Adaption/Innovation Indicator

IT: Management for Business (SCQF level 10)

- ITMB3.2.d. Put forward, demonstrate value and gain commitment to a moderately complex technology-oriented solution, demonstrating understanding of business need, using open questions and summarising skills and basic negotiating skills
- ITMB3.2.e. Apply analytical and critical thinking skills to Technology Solutions development and to systematically analyse and apply structured problem-solving techniques to them

3.3. Professional attributes

- ITMB3.3.a. Deal with different, competing interests within and outside the organisation with excellent negotiation skills
- ITMB3.3.b. Conduct effective research, using literature and other media, for IT and business-related topics
- ITMB3.3.c. Demonstrate competence in gathering information from people using a variety of techniques including interviewing
- ITMB3.3.d. Gained an understanding of performance evaluation tools and be able to demonstrate competence in designing and applying performance evaluation tools (including 360-degree feedback)
- ITMB3.3.e. Understand the importance of learning strategies and techniques in own development and life-long learning and for corporate learning and development
- ITMB3.3.f. Recognise the principles of personal development planning Create, implement and maintain a personal development portfolio and a personal action plan

3.4. Team working

- ITMB3.4.a. Plan and implement work goals, objectives, priorities and responsibilities with others
- ITMB3.4.b. Communicate with other people in the team, identifying the different abilities and potential within a team and show respect for individuals in the team
- ITMB3.4.c. Understand how teams work effectively to produce technology solutions, working with team members to identify and solve problems and disagreements, share feedback with others on the achievement of team objectives and making suggestions and encouragement for improving team-working

Table 4 Skills and knowledge coverage in software project and delivery management

4. Software project and delivery management	
4.1.	Project management approaches and methodologies
4.2.	Project planning
4.3.	Project execution
4.4.	Agile project delivery
4.5.	Risk assessment and management

4.1. Project management approaches and methodologies

- ITMB4.1.a. Have gained an understanding of the software development lifecycles and processes
- ITMB4.1.b. Follow a systematic methodology for initiating, planning, executing, controlling, and closing technology solutions projects
- ITMB4.1.c. Applies industry standard processes, methods, techniques and tools to execute projects
- ITMB4.1.d. Be familiar with structured programme and project management environments, such as 'waterfall' methods, and be able to apply the underpinning philosophy and principles of agile in a project situation even in a non-agile environment
- ITMB4.1.e. Be able to communicate technical and agile concepts to non-technical people

4.2. Project planning

- ITMB4.2.a. Identify all stakeholders involved in the project and agree the purpose of the project with all relevant stakeholders
- ITMB4.2.b. Identify and agree the project scope, timescale, aims and objectives and be able to construct a project specification and plan for a multi-threaded project, including resources and budget
- ITMB4.2.c. Understand how to estimate the range of digital development activities and produce overall estimates of costs/effort and allocating and managing appropriate phased contingency

4.3. Project execution

- ITMB4.3.a. Is able to manage a project (typically less than six months, no inter-dependency with other projects and no strategic impact) including identifying and resolving deviations and the management of problems and escalation processes
- ITMB4.3.b. Understand how to identify and manage deviations from the planned schedule of a project

IT: Management for Business (SCQF level 10)

- ITMB4.3.c. Understand the importance of regular project reviews and the need to effectively manage the project review process, including planning and management
- ITMB4.3.d. Understand the issues of quality, cost and time concerned with project implementation, including contractual obligations and resource constraints

4.4. Agile project delivery

- ITMB4.4.a. Gain an understanding of agile project delivery and be able to roll out a business system project accurately, timely, in a customer friendly way and consistent with the business needs
- ITMB4.4.b. Understand the importance of delivering value early and often, iterating and continuously improving workflows where necessary
- ITMB4.4.c. Understand the need to identify and manage project deliverables
- ITMB4.4.d. Recognise the principles of quality assurance for project deliverables, including contractual obligations
- ITMB4.4.e. Understand the roles and responsibilities of a typical agile project management team and how they interact

4.5. Risk assessment and management

- ITMB4.5.a. Identify, analyse and prioritise project risks and issues
- ITMB4.5.b. Record and communicate risks through risk reports, registers or logs
- ITMB4.5.c. Plan and implement contingency plans and risk responses
- ITMB4.5.d. Track risks and associated tasks
- ITMB4.5.e. Understand the nature of risk and how to respond to risks

Appendix C. Framework development summary

A GA framework sets out the required knowledge, skills and learning outcomes identified through employer and key partner consultation to support the delivery of a Graduate Apprenticeship programme. This is achieved through employer and key partner input to Technical Expert Groups (TEGs).

TEGs are short life working groups designed to act as an advisory group on behalf of the sector and contributes to the development and course design of a GA. TEGs are integral to the process of developing GAs that provide quality, consistency and relevance to industry.

Each TEG is made up of employers, professional or industry bodies, learning providers, and subject/technical experts from the related industry.

The following organisations were consulted in the development of this framework:

IT: Management for Business (SCQF level 10)

Employers	Learning providers	Qualification and industry bodies
HPE	Glasgow Caledonian University	TechPartnership
BT	Open University	
DFID	Heriot Watt University	
Virgin Media		
CGI		
Standard Life		



This framework is also available on the Skills Development Scotland corporate website:
www.skillsdevelopmentscotland.co.uk