

Programme specification

(Notes on how to complete this template are provide in Annexe 3)

1. Overview/ factual information

Programme/award title(s)	Digital and Technology Solutions Degree Apprenticeship (BSc)
Teaching Institution	Ada, National College for Digital Skills
Awarding Institution	The Open University (OU)
Date of first OU validation	-
Date of latest OU (re)validation	-
Next revalidation	-
Credit points for the award	360
UCAS Code	-
JACS Code	-
Programme start date and cycle of starts if appropriate.	October 2019
Underpinning QAA subject benchmark(s)	Quality Assurance Agency's (QAA) Subject Benchmarks Statement for Computing 2016
Other external and internal reference points used to inform programme outcomes. For apprenticeships, the standard or framework against which it will be delivered.	Digital & Technology Solutions Professional – degree apprenticeship Standard https://www.instituteforapprenticeships.org/apprenticeship-standards/digital-and-technology-solutions-professional-degree/
Professional/statutory recognition	
For apprenticeships fully or partially integrated Assessment.	Fully Integrated Assessment
Mode(s) of Study (PT, FT, DL, Mix of DL & Face-to-Face) Apprenticeship	FT
Duration of the programme for each mode of study	Three Years
Dual accreditation (if applicable)	
Date of production/revision of this specification	

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

More detailed information on the learning outcomes, content, and teaching, learning and assessment methods of each module can be found in student module guide(s) and the students handbook.

The accuracy of the information contained in this document is reviewed by the University and may be verified by the Quality Assurance Agency for Higher Education.

2.1 Educational aims and objectives

The overarching aim of the programme is to produce self-aware, socially responsible, graduate Digital & Technology Solutions Professionals, specifically prepared to respond to the challenges of the business world and capable of making a real and valuable contribution to their employer from the start of their employment.

Graduates will be technically competent individuals who think and communicate effectively and who can conduct inquiry, solve problems, undertake critical analysis and deliver effective software systems solutions in a constantly changing business context. Their programme of study will provide a solid foundation for lifelong learning, emphasising the development of knowledge, skills and professional values essential to the practice of systems development.

By the end of the programme, students will be able to demonstrate a sound and systematic understanding of the main areas of the body of knowledge within their programme of study, together with an ability to exercise critical judgement, especially in its application to real world contexts. The educational aims of the programme are fulfilled through the common core and as required for each of the named pathways.

The educational aims of the programmes are to provide apprentices with opportunities:

- To develop detailed knowledge, practical skills and a systematic understanding of digital and technology solutions.
- To recognize and appreciate the nature, role and importance of digital and technology solutions within IT organisations including the importance of social responsibility, security and sustainability.
- To select and employ appropriate technologies, tools, techniques and methods for understanding, developing, deploying and operating digital and technology solutions in business contexts.
- To develop detailed knowledge, practical skills and a systematic understanding through the reflection of work-based learning and the integration between work and learning.
- To exercise the personal and inter-personal skills required to work closely and communicate with others in all aspects of digital and technology solutions and to transfer knowledge and understanding to others.
- To confidently and critically apply a broad set of problem-solving and modelling skills appropriate to business systems development and operations.

Additionally for the Software Engineer Pathway:

- To develop in-depth knowledge and understanding of the engineering principles behind all stages of the software development process including requirements, analysis, design, development, and the provision of security robustness and the ability to design, build and test high-quality software solutions.

Additionally for the Data Analyst Pathway:

- To develop in-depth knowledge and understanding of data structures, software development procedures, and a range of analytic tools for standard and custom studies, and the ability to manage, cleanse, abstract and aggregate data across the network infrastructure, document and report the results of data analysis activities and make recommendations to improve business performance.

Additionally for the IT Consultant Pathway:

- To develop in-depth knowledge and understanding of models tools and techniques of business analysis, solutions development, network infrastructure, data and cyber security and to advise clients on how to make the best use of technology to meet their business objectives, overcome problems and increase productivity.

2.2 Relationship to other programmes and awards

(Where the award is part of a hierarchy of awards/programmes, this section describes the articulation between them, opportunities for progression upon completion of the programme, and arrangements for bridging modules or induction)

N/A

2.3 For Foundation Degrees, please list where the 60 credit work-related learning takes place. For apprenticeships an articulation of how the work based learning and academic content are organised with the award.

N/A

2.4 List of all exit awards

Certificate of Higher Education (CertHE),
Diploma of Higher Education (DipHE)

Digital & Technology Solutions Professional Degree Apprenticeship

Year One (Four Core modules, two pathways modules)

SDLC & Project Management (L)
Database Systems (L)

Computer Programming (L)
Ethics and Commercial Reasoning

Software Engineer

Testing - Integration & Automation
Data Structure and Algorithms

Data Analyst

Data Analysis Concepts
Statistics for Data Analysis

IT Consultant

Data Analysis Concepts
Testing - Integration & Automation
**Introduction to Cloud Computing
(non-credited)*

L : Launch-Pad

Certificate of Higher Education (120 credits)

Year Two (Three Core modules, three pathways modules)

Networking & Security
Data Analytics and Business Insights

User Interface Design

Software Engineer

Advanced Programming (*compulsory*)
Artificial Intelligence
Web Design & Authoring
Mobile App. Development

Data Analyst

Data Visualisation
Artificial Intelligence
Data Analytics with Python

IT Consultant

Entrepreneurship & Innovation
Business Risk Analysis
Distributed Systems

Diploma of Higher Education (240 credits)

Year Three (Three Core modules, two pathways modules)

Synoptic Project & Dissertation (Double credited)
Research Skills & Academic Communications

Work Based Portfolio

Software Engineer

Enterprise Programming
Software Quality Assurance

Data Analyst

Data Mining & Warehousing
Big Data Analytics
Technology Entrepreneurship
in Practice

IT Consultant

Emerging Technologies in Business
Technology Entrepreneurship in Practice

BSc Degree Apprenticeship (360 credits)

3. Programme structure and learning outcomes

<u>Programme Structure - LEVEL 4</u>					
Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable?	Semester runs in
SDLC & Project Management	20	Data Structure and Algorithms	20	No	
Computer Programming	20	Testing - Integration & Automation	20		
Database Systems	20	Data Analysis Concepts	20		
Ethics and Commercial Reasoning	20	Statistics for Data Analysis	20		

Intended learning outcomes at Level 4 are listed below:

On successful completion of Level 4, the students should be able to:

<u>Learning Outcomes – LEVEL 4</u>	
3A. Knowledge and understanding	
Learning outcomes:	Learning and teaching strategy/ assessment methods
A1. Appreciate the commercial need for computing applications, their nature and evolution and identify a limited number of core development tools, languages and current techniques and technologies that support this.	Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes): <ul style="list-style-type: none"> • lectures (A1-A5); • directed reading (A1-A5); • use of the VLE (A1 – A5);

<u>Learning Outcomes – LEVEL 4</u>	
3A. Knowledge and understanding	
<p>A2. Explain a current set of techniques and tools for the specification of requirements, analysis, design, implementation and testing of software systems, thereby adopting a software engineering approach.</p> <p>A3. Demonstrate a good knowledge of the software development lifecycle, the role of project management and team-working in developing computing and information systems solutions to problems faced by organisations and individual users.</p> <p>A4. Appreciate the fundamental professional, ethical, social and legal issues involved in the development and operation of computing systems and the ethical implications of handling data and information.</p> <p>A5. The strengths and weaknesses of selected statistical/data analytics software and selected programming languages and their use to extend capabilities for data analysis and visualisation.</p>	<p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • examinations (A1-A3); • coursework essays (A4-A5);

3B. Cognitive skills	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>B1.Apply programming principles and constructs to implement solutions to small scale problems.</p> <p>B2.Analyse, design, build and test a software solution and identify security issues that affect the solutions.</p> <p>B3.Identify a problem and select and apply methods and tools for its solution drawing on industry practice.</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • lectures (B1-B4); • workshops (B1-B4); • directed reading (B1-B4); • use of the VLE (B1 – B4);
<p>B4.Identify, select, apply and evaluate advanced problem-solving and modelling skills appropriate to developing technology solutions for business.</p> <p>B5.Analyse, categorise and interpret data and information statistical models.</p>	<p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • examination (B5); • coursework design and implementation (B1-B3); • coursework report/essay (B4-B5);

3C. Practical and professional skills	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>C1. Apply sound programming principles to the construction and maintenance of software using appropriate programming paradigms and languages.</p> <p>C2. Employ analytical techniques and design tools in the development of software artefacts.</p> <p>C3. Present, evaluates, and interprets qualitative and quantitative data, to develop lines of argument and make sound judgments in accordance with basic theories and concepts of data analytics.</p> <p>C4. Apply a range of software tools to design, develop and test security solutions to protect access to information and data.</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • workshops (C1-C4); • group exercise (C1-C5); <p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • coursework design and implementation (C1-C3); • coursework report/essay(C4);

3D. Key/transferable skills	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>D1. Manage the time and resources and appreciate the role of teamwork within the IT discipline.</p> <p>D2. Reflect systematically on their solution and their own performance to further develop learning.</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • directed reading (D1-D4); • use of the VLE (D1 – D4);

3D. Key/transferable skills	
D3. Formulate an action plan for personal improvement, in the context of their work role and career.	Assessment strategies and methods (referring to numbered Intended Learning Outcomes):
D4. Communicate information and ideas in written and oral form.	

- coursework report/essay (D1-D4)
- Presentations (D4)

The exit award(s) at Level 4 is Certificate of Higher Education (CertHE)

<u>Programme Structure - LEVEL 5</u>					
Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable?	Semester runs in
Networking & Security	20	Advanced Programming	20	No	
Data Analytics and Business Insights	20	Artificial Intelligence	20		
User Interface Design	20	Business Risk Analysis	20		
	20	Web Design & Authoring	20		
		Data Analytics with Python	20		
		Distributed Systems	20		
		Mobile App. Development	20		
		Data Visualisation	20		
		Entrepreneurship & Innovation	20		

Intended learning outcomes at Level 5 are listed below:

On successful completion of Level 5, the students should be able to:

<u>Learning Outcomes – LEVEL 5</u>	
3A. Knowledge and understanding	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>A6. Explore current techniques and tools for the specification of requirements, analysis, design, implementation and testing of computing systems, thereby adopting a software engineering approach.</p> <p>A7. Discuss the hardware platforms, network architectures, technologies and standards, used in and to support IT systems and the fundamental techniques and issues involved in their management and security.</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none">• lectures (A6-A10);• directed reading (A6-A10);• use of the VLE (A6 – A10);

<u>Learning Outcomes – LEVEL 5</u>	
3A. Knowledge and understanding	
<p>A8. Demonstrate competency in object-oriented design and algorithmic and mathematical approaches to solve medium scale problems.</p> <p>A9. Have advanced programming skills for the management, manipulation, analysis, and visualisation of a broad variety of data formats.</p> <p>A10. Discuss the professional, ethical, and legal issues involved in the development and operation of IT systems; and demonstrate knowledge of business concepts and the ethical implications of handling data and information.</p>	<p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • examinations (-); • coursework essays (A6-A10);
3B. Cognitive skills	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>B6. Select, apply and critically evaluate appropriate techniques for the analysis, design, development and testing of computer solutions to meet given user requirements.</p> <p>B7. Generate an innovative design to solve a problem containing a range of commercial and industrial constraints.</p> <p>B8. Select and deploy appropriate theory, practices and tools for the specification, design, implementation and evaluation of</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • lectures (B6-B8); • workshops (B6-B8); • directed reading (B9); • use of the VLE (B9);

3B. Cognitive skills	
<p>application software and computer-based systems (including, distributed systems and web-based systems) to meet given requirements under practical constraints.</p> <p>B9. Demonstrate the skills necessary to plan, conduct, critically evaluate, report, and present a substantial project in commercial setting.</p>	<p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • examination (-); • coursework design and implementation (B6-B8); • coursework report/essay (B9);

3C. Practical and professional skills	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>C5. Plan and execute a medium-scale software project with appropriate software engineering principles.</p> <p>C6. Apply appropriate control measures to minimise risks of security breaches in a range of network environments and data storage systems, drawing on industry practice.</p> <p>C7. Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis.</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • workshops (C5-C7, C9); • group exercise (C8);

3C. Practical and professional skills	
<p>C8. Effectively communicate information, arguments, and analysis, in a variety of forms, to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively.</p> <p>C9. Select and apply appropriate machine learning algorithms to provide systematic data analytics solutions to a reasonable range of problems.</p>	<p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • coursework design and implementation (C5-C7, C9); • coursework report/essay(C8);
3D. Key/transferable skills	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>D5. Demonstrate and exercise independence of mind and thought and appreciate the professional and ethical issues surrounding the development and use of IT applications</p> <p>D6. Develop self-management skills to manage one's own time, meet deadlines and work with others.</p> <p>D7. Demonstrate an understanding of the importance of information and security to business, and the key legal and ethical issues encountered when securing access to data.</p> <p>D8. Evaluate and analyse your own learning experience.</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • directed reading (D5-D6, D8); • use of the VLE (D7); <p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • coursework report/essay (D5-D8) • Presentations (D5-D8)

The exit award at Level 5 is Diploma of Higher Education (DipHE)

<u>Programme Structure - LEVEL 6</u>					
Compulsory modules	Credit points	Optional modules	Credit points	Is module compensatable?	Semester runs in
Synoptic Project & Dissertation	40	Enterprise Programming	20	No	
Work Based Portfolio	20	Data Mining & Warehousing	20		
Research Skills & Academic Communications	20	Emerging Technologies in Business	20		
		Software Quality Assurance	20		
		Big Data Analytics	20		
		Technology Entrepreneurship in Practice	20		

Intended learning outcomes at Level 6 are listed below:

On successful completion of Level 6, the students should be able to:

<u>Learning Outcomes – LEVEL 6</u>	
3A. Knowledge and understanding	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>A11. Demonstrate critical analysis and logical reasoning to the theoretical, conceptual and practical issues central to developing technology solutions.</p> <p>A12. Possess good knowledge of technical problems in an enterprise context in order to make architectural design recommendations.</p> <p>A13. Have a good understanding of business intelligence and development strategy for managing technical solutions to business problems.</p> <p>A14. Possess in-depth knowledge of state-of-the art software tools for the implementation of large-scale data analytics solutions.</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • lectures (A11-A14); • directed reading (A11-A14); • use of the VLE (A11 – A14); <p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • examinations (A11); • coursework essays (A12-A14);

3B. Cognitive skills	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>B10. Critically evaluate established and cutting edge techniques and tools for the specification of requirements, analysis, design, implementation and testing of computing systems, thereby adopting a software engineering approach.</p> <p>B11. Critically review and evaluate the theory and products available with respect to their chosen topic for the major project.</p> <p>B12. Critically evaluate and test systems to ensure the system meets the criteria for its use and future development.</p> <p>B13. Apply critical analysis and logical reasoning to the theoretical, conceptual and practical issues central to recommending technology solutions for business.</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • lectures (B10); • workshops (B11-B13); • directed reading (B10-B13); • use of the VLE (B10 – B13); <p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • examination (B10); • coursework design and implementation (B11-B12); • coursework report/essay (B13);

3C. Practical and professional skills	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>C10. Employ the research skills needed to investigate a defined topic under supervision, through an extended individual project.</p> <p>C11. Analyse, design, build and test effective software solutions and applications, adopting a software engineering approach, to varied digital technology problem domains, using and presenting relevant research, information and data.</p> <p>C12. Apply critical analysis and logical reasoning to the theoretical, conceptual and practical issues central to recommending technology solutions for business.</p> <p>C13. Demonstrate a reflective approach to the development of new skills and knowledge in order to develop the competences required by the projects they are working on.</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • workshops (C10-C12); • group exercise (C13); <p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • coursework design and implementation (C11-C2); • coursework report/essay (C10, C13);

3D. Key/transferable skills	
Learning outcomes:	Learning and teaching strategy/ assessment methods
<p>D9. Recognise the need for lifelong learning and undertake appropriate continuing professional development, taking control of the learning process including organisational skills, time and workload management.</p> <p>D10. Effectively communicate design ideas and technical issues using verbal, visual and written techniques and media appropriate to the target audience.</p> <p>D11. Be entrepreneurial, innovative, foster creativity and drive, and manage the process of change.</p> <p>D12. Autonomously manage a project with respect to time and task management; and make decisions independently with respect to the needs and limitations of a project.</p>	<p>Learning and teaching strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • directed reading (D1-D4); • use of the VLE (D1 – D4); <p>Assessment strategies and methods (referring to numbered Intended Learning Outcomes):</p> <ul style="list-style-type: none"> • coursework report/essay (D9-D11) • group work (-) • Presentations (D12)

The exit award at Level 6 is BSc Apprenticeship Degree

4. Distinctive features of the programme structure

- **Where applicable, this section provides details on distinctive features such as:**
 - where in the structure above a professional/placement year fits in and how it may affect progression
 - any restrictions regarding the availability of elective modules
 - where in the programme structure students must make a choice of pathway/route
- **Additional considerations for apprenticeships:**
 - how the delivery of the academic award fits in with the wider apprenticeship
 - the integration of the 'on the job' and 'off the job' training
 - how the academic award fits within the assessment of the apprenticeship

This programme is a BSc Degree Apprenticeship and combines academic study with professional practice. The programme is designed for employers and their employees (the students) providing the opportunity to combine academic study with professional practice in the digital and technology sector. Students will be employed as an apprentice in a digital and technology role throughout their studies and thus be able to apply their discipline knowledge to professional and industrial practice as they progress through the programme.

This combination of academic learning at degree level with on the job practical training provides a holistic programme of education enabling students to become confident, competent and capable IT professionals. The curriculum is designed with input from employers to ensure its relevance to industry and fulfils both the educational requirements for an Open University Degree and the BSc Digital & Technology Solutions Degree Apprenticeship Standard, part of the government's initiative to develop apprenticeships at higher skill levels. This includes the delivery of the skills, knowledge and behaviours set out in the occupational standard and specific requirements with regard to the way the programme is delivered and assessed.

The aim of the programme is to produce highly motivated, technically competent individuals who have the awareness, understanding and the necessary flexibility to work effectively in a variety of IT roles within their workplace. The programme also aims to develop students' critical abilities, general problem solving skills and lay a foundation for continued self-improvement and life-long learning, essential for today's IT professional. Importantly, much of the student development throughout the degree will take place in their workplace, where context and real live situations provide deep learning opportunities.

With three streams, Software Engineer, Data Analyst and IT Consultant, as well as flexibility to incorporate work-based projects, the programme develops the skills and knowledge required for a wide range of computing-related career paths. Each stream is defined in terms

of core outcomes that are common to all streams and a set of knowledge and skills specific to that stream. Furthermore, the emphasis on personal and professional reflection in the work-based portfolio should develop self-managed professionals who will take control of their own future development. Through specific core modules, the programme also aims to challenge students in their ways of thinking, behaving and learning, including the consideration of ethics and sustainability.

The learning for the programme is centred on a real job within business that extends the learning beyond the classroom and into the workplace. The aim is to integrate academic learning at degree level and on-the-job practical training to provide a holistic programme of education and training to meet the skills needs of employers now and in the future.

The degree programme has three levels (level 4 to level 6), each equivalent to a normal academic year. The programme is 50 weeks' duration per year with 80% of work-based learning and 20% of college study. Apprentices studying on this degree will study at Ada College for 10-11 weeks a year for a duration of three years. This pattern of study is designed to fit around full-time employment and uses a blended learning approach, which mixes work-based study and attendance at college study weeks. This approach allows students to be both productive employees, learning relevant skills on the job, and participants in a learning community of students who are broadening and deepening their professional knowledge together.

The first eight weeks of the programme at level 4 is delivered as "Launch-pad" at the college. The Launch pad will provide an opportunity for students to consolidate their learning, receive academic tutorial support, allow revision time and provide an introduction to the next unit in the schedule.

The curriculum is based on the core learning and skills outcomes defined in the Degree Apprenticeship standard. The core learning outcomes cover approximately 60% of the content, whilst the specialism learning and skills outcomes as required for each of the three pathways cover approximately 40% of the content. Both the core and specialism learning are covered and developed at all levels of the programme.

On successful completion of the four core modules at level 4 during the eight-week Launch-pad period, students will make a choice of their specialism pathway. The students are then required to successfully complete the two-specialism modules of the chosen pathway at this level in order to progress to level 5 of the programme.

To enable students to link theory and practice in the workplace the programme includes a work-based e-portfolio constructed over the course of three years and a workplace-based module in year three to allow the student to focus on their degree specialism. The Work-based Synoptic Project in year three is the common module grounded in the student's degree specialism and address pertinent challenges identified by the student/employer.

Each module is a self-contained block of learning with defined aims, learning outcomes and assessment. A standard module is worth 20 credits. It equates to the learning activity expected from one sixth of a full-time year. All modules are of 20 credits, apart from the 'Synoptic Project' modules taken in year three that is 40 credits in size.

A core part of this degree is the requirement for apprentices to develop an e-portfolio. The intention is that this portfolio will provide a record of the specific skills and knowledge they have developed and used in the workplace and provide an opportunity to reflect on their personal development. Given the pace of change in technology, it is critical that learners completing this degree are self-aware and self-managed with respect to their own professional development, that they are reflective practitioners.

The requirement to reflect on their progress throughout the degree combined with formative feedback will develop the necessary skills and self-discipline to support such development. The e-portfolio will be developed over all three years but be formally assessed at the end of the degree. Teaching staff and work mentors will guide apprentices in the development of this portfolio. Teaching staff will review the portfolio from the point of view of its assessment at level 6 and provide formative feedback at set times throughout the degree to guide the apprentice in developing an appropriate portfolio. Work mentors will guide the students from the point of view of documenting their work experience and completion of objectives.

5. Support for students and their learning.

(For apprenticeships this should include details of how student learning is supported in the work place)

5.1 Overview

The general approach is predicated on providing a degree that:

- Reflects current professional practice and values that help apprentices to continually develop as world-class professionals.
- Is tailored by consultation with employers.

- Provides a professional approach to the delivery of learning and teaching that is built upon staff professional skills, research informed subjects and continuous professional development.

The learning, teaching on these degrees provide:

- An emphasis on professional skills development within the workplace and at college that is embedded in the learning, teaching and assessment process.
- Alternative modes of learning to support the needs, preferences and abilities of all of our students. A mix of alternative approaches such as lectures, seminars, laboratory classes, simulations, videos and self-directed study will be used.
- Using research informed teaching as a bridge between research and teaching with an increased emphasis at level 6.
- Use of diagnostic online and in-class testing to identify student progress and individual learning needs. Flexible levels of additional support to challenge exceptional students and support those identified as needing further help to progress.
- The consistent use of a wide range of digital resources including IT equipment, use of a virtual learning environment and digital library resources.
- Working in partnership with students to enhance their experience, including staff-apprentice liaison meetings and regular apprentice surveys of learning, teaching and assessment at a module and programme level.
- Independent Learning and Reflection that requires learners to take responsibility for their own learning by being pro-active in seeking out new learning opportunities.

5.2 Technology Enhanced Learning

The use of technology enabled learning materials, allows flexibility in the delivery of the programme, supports independent learning, and aids inclusivity. All units will make extensive use of the College's virtual learning environment (VLE). The VLE is used, not only as a repository for course notes, examples and exercises and as a mechanism for making announcements, but also to provide additional learning resources such as videos, links to journal articles, formative quizzes, and a mechanism to submit assessments and return feedback. Students using the VLE will be able to take their learning beyond the classroom.

Moreover, students will be provided with their own domain, so they can establish their own online identity, collect their work, create a blog based portfolio, etc.

As part of the introduction to their module, module leaders will introduce students to the classroom site, and how to navigate their way round it and how it will be used on that particular unit. To facilitate remote meetings staff and students may make use of screen sharing technologies and video conferencing software (e.g. Skype™). Employers will not have access to student VLE areas but some form of electronic forum will be used to maintain contact with work mentors.

5.3. Personal Development Planning

Personal Development Planning (PDP) is designed to help students make the most of their college education and to help plan their career. PDP focuses on helping students to develop a range of academic skills. It also facilitates preparation for their career after graduation. A comprehensive guide for PDP can be found on the college's VLE. Furthermore, the Degree has a mandatory requirement for completion of an e-portfolio that covers all three years. The e-portfolio is owned by the student and not embedded in college systems. The portfolio will be used to document progress towards the personal and professional objectives set within the host company as well as document the students' progress towards mastery of the learning outcomes defined as core within the degree.

5.4 Support at Workplace

- Ada College, will appoint apprenticeship Skills Coaches to manage the relationship between employer, apprentices' working for that employer, and the College.
- Similarly, the employer will appoint a supervisor, who will work closely with the apprenticeship link officer, to oversee delivery and evidencing of relevant training delivered in the workplace via a learning log, in agreement with the College.
- At your workplace, you will be supported by your employer. Exact arrangements and terminology are the responsibility of the employer, but typically, you will be supported as follows, where the roles may be combined in one person.
- A Mentor/Supervisor designated by the employer to provide vocational and pastoral support for individual students, who may or may not be your line manager. In particular support will be provided for work-based learning assignments and the final year project.

- An Apprenticeship Liaison Manager who manages the relationship between the programme (via the skill coaches) and the employer.
- The College and the employer are bound by contract to work together to support you as an apprentice. This will include quarterly meetings between the College, the student, and the employer.

5.5 Roles and Responsibilities

Apprentices are required to :

- Engage fully during planned Work-based Learning (WBL) in order to achieve the stipulated learning outcomes;
- Inform the Apprenticeship Skills Coach or of any issue which is likely to affect the achievement of the agreed learning outcome for the WBL;
- Confirm to the regulations and policies of the placement organisation;
- Maintain the confidentiality of any sensitive information concerning the organisation and its business;
- Submit the e-portfolio within the specified deadline;

The employer is required to :

- Define clearly the types and nature of placement learning opportunities available in the organisation;
- Induct, support and provide learning opportunities to meet the WBL needs of the apprentice;
- Review and assess the apprentice's progress during the placement learning episode;
- Provide relevant and organisation specific information on regulations, health & safety policies and the nature of the business;
- Enable the apprentice to gain a fair, safe and equitable WBL opportunities;
- Advise the Apprenticeship Skills Coaches of any issues which may affect the apprentices' experience and outcome during a planned WBL Practice;
- Assist and guide the apprentice in the development and completion of the WBL e-portfolio in accordance with the stipulated guidelines;
- Work in partnership with the College in the maintenance and enhancement of the quality of the WBL opportunities;

The Apprenticeship Skills Coaches are required to:

- Carry out reviews in person with apprentices and line managers to monitor progress against key milestones
- Provide rigorous feedback on work-based e-portfolio evidences
- Work with apprentice to create and monitor their individual learning plans
- Provide personal and professional support to apprentices and employers
- Ensure monthly performance updates on learners are provided to Ada
- Track the progression of all key programme elements
- Assess whether apprentices are ready to enter gateway and support them to prepare for their end point assessment
- Ensure all apprentice records are maintained and compliant to ESFA regulations

5.6 Commitment statement

The apprentice shall :

- Attend training sessions, either on- or off-the-job, as and when required;
- Liaise with the skills coach and the employer, as applicable, in relation to any reviews, monitoring, or audits required for the apprenticeship, including providing information for, and access to, all documentation relevant to the apprenticeship on request;

The employer shall

- Provide a safe and supportive environment for the work-based elements of the apprenticeship;
- Ensure that the apprentice's roles at work allow him/her to gain the wider employment experience required by the programme and the apprenticeship framework;
- Ensure that the apprentice is given sufficient time to enable him/her to complete all elements of the work-based learning elements of the programme within his/her contracted working hours;
- Allow the apprentice to attend all agreed off-the-job learning and shall continue to pay the apprentice during such time, where it falls within normal working hours;

The College shall

- Deliver the academic learning elements of the programme and establish and/or deliver on- and off-the-job learning to meet the needs of the apprenticeship, the apprentice and the employer;

- Monitor the apprentice's progress in liaison with the employer, and the link tutor shall keep the employer informed of the apprentice's progress, including any disciplinary issues;
- Monitor the quality of learning delivery to ensure that it meets the required standards, including liaising with both the employer and the apprentice;

6. Work-based Learning Framework

Authentic and innovative work-based learning is an integral part of degree and its design. It enables learners to take on appropriate role(s) within the workplace, giving them the opportunity to learn and apply the skills and knowledge they have acquired as an integrated element of the programme. It involves the development of higher-level learning within both the higher education provider and the workplace. It is a two-way process, where the learning in one environment is applied in the other. Work-based Learning and engagement with employers have been embraced accordingly in this programme through construction of an e-portfolio over three years and the Level 6 Work-based Synoptic Project and Dissertation module.

6.1 Educational aims of the WBL Framework

The aims of the WBL Framework are:

- To enable the College to provide higher education programmes customised to the needs of employer partners.
- To provide accessible and flexible opportunities for the apprentices to gain a comprehensive range of higher education qualifications at levels 4 to 6.
- To provide a means to recognise and accredit higher-level learning that is specifically achieved in the context of work to promote continuing personal and professional development.
- To enable individuals to recognise their own work-based learning as the subject of higher education study.
- To enable individuals to develop higher-level knowledge and understanding, and cognitive, practical, personal and enabling skills from the study of their own work-based learning.
- To provide the means to construct negotiated work-based projects, in partnership with employers that are designed to meet their development needs.

6.2 Descriptors and Learning outcomes

Work Based Learning Framework specify opportunities for students to achieve and demonstrate learning outcomes at appropriate academic levels. The Framework includes work-based learning level descriptors that describe learning achievement in four categories at each level:

- Knowledge and understanding
- Cognitive skills
- Practical skills
- Personal and enabling skills

All work-based learning modules specify learning outcomes that appropriately reflect these level descriptors. The work-based learning outcomes describe what students should be able to demonstrate on successful completion of a Work Based Learning module.

6.3 Learning and Teaching

Work-based learning operates a blended learning and teaching approach in line with the College's Learning, Teaching and Assessment strategy. The following methods are offered to enable students to develop their knowledge and understanding:

- Induction workshops
- Formative feedback on work from the student's workplace mentor
- Tutor-led face to face and online discussion/meeting
- Student-led interaction via online discussion forums
- Student-led interaction with workplace colleagues
- Self-directed learning facilitated by programme handbook and other learning materials

6.4 Work-based E- Portfolio

To successfully complete an apprenticeship, the learners need to demonstrate both knowledge and behaviours and have the skills of applying that knowledge in the workplace that is demonstrated with work based 'evidence'. The evidence contained in the e-portfolio will comprise of complete and/or discrete pieces of work that covers the totality of the Level 6 Digital & Technology Solutions Professional Apprenticeship Standard.

In the e-portfolio, apprentices present evidence from real-work projects, illustrating the application of all the knowledge, skills and behaviours set out in the standard. This is produced towards the end of the apprenticeship with evidence from projects that have been completed, usually, towards the end of the apprenticeship. The e-portfolio is assessed as

part of the end-point assessment. The portfolio is not evidence that the learning has taken place, but is evidence that the apprentice has applied that learning in a holistic and coherent way.

The evidence contained in the e-portfolio will comprise a small number of complete and/or discrete pieces of work which, together, cover the totality of the standard. It will showcase their very best work, enabling them to demonstrate how they have applied their knowledge and understanding in a real-work environment to achieve real-work objectives. Employers and training providers will assist the apprentice to assemble their e-portfolio to ensure that the summative portfolio is complete, that it covers the standard and has been done to a satisfactory level. The evidence should be based on real work projects or outputs.

Evidence of work-based activities may be in the form of:

- Practical exercises
- Projects
- Development plans
- Team work

The completed e-portfolio will be assessed against the requirements summarised in the standard and set out in detail in the occupational brief. An independent assessor who makes his or her own judgement on the quality of the work carries this out. The independent assessor may also note particular aspects of the work that they wish to discuss with the apprentice during the interview, either to confirm their judgement and/or provide further information on which to base their grading decisions. The evidence will be assessed against all components of the standards, i.e.:

- Technical competencies
- Technical knowledge and understanding
- Underpinning skills, attitudes and behaviour.

The evidence in the portfolio will be examined for:

- Completeness – the evidence in the e-portfolio, taken together, must cover the totality of the standard.
- Quality – the evidence must at least satisfy the minimum requirements for each area of the standard.

Skill Coaches will assist the apprentice to develop their portfolio to ensure that it is complete and that it covers the Core Standard.

6.6 Synoptic Work-based Project

The Synoptic work-based project is a part of the degree, which contributes to the final mark (i.e. classification) of the degree. The details of the assessment are contained in the respective module descriptor as well as the student handbook. The work-based project is a substantial piece of work to be undertaken at level 6, during the final year of the degree.

The project must bring together elements of learning from different parts of the programme and show evidence of accumulated knowledge and understanding of management, and the application of these within their organisation. The project must meet the standard and demonstrate the approach taken to the planning and completion of the project.

Because of the significance of the project, the employer and college must work together with the apprentice to agree a project that is achievable within the employer's business constraints whilst meeting the needs of the Standard. The project should be conducted as part of the apprentice's normal work. The employer should make allowances, in terms of time and resource, for the project to be undertaken. Any elements, which need to be undertaken outside of normal work, should be agreed between the employer, apprentice and Provider so that apprentices are not disadvantaged in any way from performing their job and meeting the requirements of the project.

The process starts by apprentices submitting a proposal. Apprentices are strongly advised to consult with their line managers when preparing the proposal, to discuss /consider issues such as ethics, IP, data protection, confidentiality, etc. The proposal requires approvals of both the college (academic standards) and the employer (work place standards). This will be finalised through discussion between Ada, the employer and the student. (In some cases the proposal is returned to the apprentice for minor/major changes based on the College/Employer feedback). Upon the approval of the proposal, apprentices will settle on their project, in conjunction with the employer and the academic team.

The requirements for the delivery of the work-based project are shown below:

Design

- A specification must be developed to show what has to be delivered on completion of the project - this must include the outputs, project plans etc.
- Terms of reference must be developed by the apprentice and agreed by the college and employer early in the project.
- The college must provide clear project assessment criteria including those for the terms of reference, approach to the problem, solution design and implementation, the final report and presentation.

- Apprentices must document their assumptions and highlight the consequences of these assumptions – enabling them to demonstrate their understanding of commercial pressures and the application of their thinking and problem solving skills.
- Agreement must be made between the apprentice, employer and college on what systems, tools and platforms will be required (if any) to complete the tasks and how these will be made available.

Delivery

- The College will work with the employer and apprentice to agree the project title and support arrangements required to enable the project to be undertaken.
- The project should normally be based on an agreed business problem that forms part of the apprentice's role.
- The employer for the apprentice to plan, undertake and write up their project should set suitable time aside.
- The apprentice must first work out what is required and present terms of reference and an initial plan for agreement with the employer and provider.
- The project should typically be undertaken at the employer's premises.
- The employer and the College must ensure that the apprentice has access to the tools and systems required to complete the tasks within the project.
- The apprentice must provide a signed statement to confirm the project is his or her own work.
- The project will be set and completed during the second year of the degree

Project Environment

- A suitable project environment should be provided ensuring access to all required tools and systems. This will be the apprentices' normal place of work.
- Someone responsible for managing the project from the employer perspective must be identified.
- The link tutor from the College must oversee and provide support to the apprentice.
- The work-based project will contribute towards the achievement of the degree.

6. Criteria for admission

(For apprenticeships this should include details of how the criteria will be used with employers who will be recruiting apprentices.)

All students must be interviewed, assessed and offered a position by an employer before being admitted to the degree. Although the College may receive direct applications and filter these applications before passing them to prospective employers some apprentices may apply directly to an employer. Either way, after acceptance by an employer, the College will require a formal application, which it will assess according to the following criteria.

Applicants must have one of the following:

- Three full A-Level Qualifications at grade C or above, preferably from STEM subjects.
-
- AND/OR Level 3 (QCF) BTEC National Diploma in Information Technology, or computing related courses
- Level 2 Professional qualification in a suitable computing related area.

(students can possess a combination of these qualifications if relevant)

- Additionally, students are normally required to have a grade 7 or above in GCSE Maths and English Language or to have demonstrated ability in Maths and English in further studies.
- In exceptional cases, the College may admit students who do not satisfy the above requirements, if they are able to demonstrate that by virtue of other studies and/or experience, they are capable of managing their studies and benefiting from the route.

7. Language of study

English

8. Information about non-OU standard assessment regulations (including PSRB requirements)

-

9. For apprenticeships in England End Point Assessment (EPA).

(Summary of the approved assessment plan and how the academic award fits within this and the EPA)

All students must undertake an independent end-point assessment (EPA) which is a synoptic assessment of the knowledge, skills and behaviours that have been learnt throughout the apprenticeship. The purpose of the assessment is to make sure the student meets the apprenticeship standard and are fully competent in the occupation. Students at the very end of the programme take it when their employer and the College is satisfied that they have met the “gateway” criteria to undertake the assessment. EPA is graded and an apprenticeship certificate is only awarded after EPA is successfully completed.

This is an integrated Bachelor’s degree level apprenticeship, which incorporates on-programme academic and workplace learning and assessment with an independent end-

point assessment to test the knowledge, skills and behaviours detailed in the standard. The degree programme maps the individual modules to the outcomes in the standard and individual modules will contribute to the on-programme assessment of knowledge, skills and behaviour outcomes en-route to the final synoptic end assessment.

As this is an integrated apprenticeship, the EPA will be conducted by College. The College has developed and will deliver the EPA as defined in the Assessment Plan . The programme consists of 360 credits that will typically take three years to complete, with 300 delivered on-programme and 60 through the EPA, which is taken in the last six months. The 60-credit EPA is achieved through a 40-credit synoptic project & dissertation, and a 20-credit work-based e-portfolio. Performance in the EPA will count towards the overall degree classification and apprentices cannot successfully complete the Bachelor's degree without passing the EPA. The EPA uses the following assessment methods and should be undertaken in this order:

- A synoptic project dissertation
- A project presentation to a panel, based on the project dissertation above
- A technical interview, conducted by the same panel as the project presentation, based on the e-portfolio evidence which includes eight reflective statements over the course of three years

The employer (in consultation with the college), will put the apprentice forward for the end-point assessment when they believe they are ready. This is known as Gateway and the apprentice needs to have met the requirements of the degree in order to satisfy the Gateway process. The degree will be classified in accordance with the Open University degree regulations. The EPA will represent 60 credits towards the final degree classification. Where an apprentice fails the EPA, they will not be awarded a BSc Degree.

In summary :

- This is an integrated degree level Apprenticeship, which incorporates on-programme academic and assessment with an independent EPA to test the knowledge, skills and behaviours detailed in the standard.
- Full time apprentices will typically spend 36 months on programme working towards the apprenticeship standard, with the EPA taken in the last six months. There will be a minimum of 20% off-the job training.

- The EPA will be conducted by Ada College towards the last six months.
- The degree programme consists of 360 credits that will typically take three years to complete, with 300 delivered on-programme and 60 through the EPA, which is taken in the last six months. The 60-credit EPA is achieved through a 40-credit synoptic project & dissertation, and a 20-credit work-based e-portfolio.
- Performance in the EPA will count towards the overall degree classification and apprentices cannot successfully complete the Bachelor's degree without passing the EPA.
- The gateway for the EPA will occur when the apprentice has completed 300 credits of their degree, been given a provisional grade and achieved English and Maths at level 2 or higher. The gateway requirements must be met, prior to taking the EPA. The EPA must be completed within a six-month period, after the apprentice has met the EPA gateway requirements.
- The EPA consists of four distinct assessment methods: Review of e-portfolio, review of project dissertation, presentation and panel interview.
- An Assessment Panel, comprised of i) an independent assessor (chair), ii) a representative from Ada, and iii) a representative from the employer integrates the process of reviewing all the submissions and assessing whether the candidates meet the Digital Technology Solutions Degree Apprenticeship Standard.
- The panel reviews the candidate's full e-portfolio, synoptic project dissertation and presentation against the standard, to ensure that the apprentice has demonstrated the full range of skills, knowledge and behaviours detailed in the standard. During this process, members of the panel will interview the apprentice, asking clarification questions.

- The panel undertakes the grading, with the final decision made by the independent assessor (chair).
- The panel will award marks based on their assessment of the e-portfolio, synoptic project dissertation and the panel interview.

(for more details, please see the Assessment Plan).

To deliver the EPA for this standard, Ada College requires the approval to be on the Skills Funding Agency Register of Apprentice Assessment Organisations. Ada College has already commenced the application to be on the register.

10. Methods for evaluating and improving the quality and standards of teaching and learning.

The college has a comprehensive quality assurance programme that monitors all programmes through programme review, achievement of performance indicators and observation of teaching and learning. This is also representation and input from employers who will contribute to curriculum development and review. In this provision, all module guides are internally verified to ensure that all learning outcomes and grading criteria are met. This programme is externally monitored by external examiners who advise on academic standards and ensure that all learning objectives have been met.

11.1 External Examiner

The role of external examiners is to assure the quality of students' learning experience and ensure that they are assessed fairly in relation to other students on the same programme and to all students across the College and nationally. External examiner's reports are an integral part of the College quality assurance processes. They form part of the requirements for programme annual review and the programme team must demonstrate how they have responded to the views and comments made by external examiner.

11.2 Indicators of Quality and Standards

Annual Review

The programme will undergo a Programme Annual Review in line with the College processes.

Student feedback

The Programme Team will employ a variety of methods to gain feedback from students on their course, including:

- Two annual student surveys - 'First term' and 'On Exit'.
- Completion of the National Student Survey (NSS) for final year students
- Individual on-line module evaluations.
- Teaching, Learning and Assessment (TLA) Committee will be held twice a year to facilitate the sharing of good practice and initiatives from internal and external developments.
- TLA committee will consist of the Dean, the Programme Director, members of teaching staff and students' representatives for each cohort.
- On-line Student forums.

Progress indicators

The progress indicators are considered on an annual basis and typically include:

- Student evaluation questionnaires. These are completed by students during in the first term and at the end of the year and (with the NSS) in their final year.
- Module evaluations which determine the students view on the quality of the modules they have studied.
- Independent internal and external reviews including QAA.
- Reviews by external examiners who comment on levels of achievement compared with standards elsewhere.
- Internal progression rates, completion rates, student success indicators.

10. Changes made to the programme since last (re)validation

N/A

Annexe 1: Curriculum map

Annexe 2 : Apprenticeship Standard for Digital & Technology Solutions Professional – degree apprenticeship

Annexe 3: Curriculum mapping against the apprenticeship standard

Annex 1 : Curriculum Map

LEVEL 4																			
Programme Outcomes		Knowledge & Understanding					Cognitive/Intellectual Skills					Practical/Professional Skills				Key Transferable Skills			
Pathway	Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D1	D2	D3	D4
Core	Computer Programming						DA					DA							
	SDLC & Project Management		DA	DA				DA		DA			DA			DA	DA	DA	A
	Database Systems	DA				DA			DA		DA			DA	DA				
	Ethics & Commercial Reasoning				DA												DA		DA
S/W Eng.	Data Structure and Algorithms						DA												
IT Consult	S/W Eng. Testing - Integration & Automation		DA					DA				A			DA				
	Data Analyst Data Analysis Concepts				D	DA					DA			DA	D				
	Statistics for Data Analysis					D					D			D					

LEVEL 5																			
Programme Outcomes		Knowledge & Understanding					Cognitive/Intellectual Skills				Practical/Professional Skills					Key Transferable Skills			
Pathway	Module	A6	A7	A8	A9	A10	B6	B7	B8	B9	C5	C6	C7	C8	C9	D5	D6	D7	D8
Core	Networking & Security		DA									DA						DA	
	User Interface Design	DA		DA			DA	DA	DA		DA					DA			DA
	Data Analytics and Business Insights				DA	DA				DA			DA	DA	DA		DA	DA	
S/w Eng.	Advanced Programming			DA							DA								
	Web Design & Authoring	DA	D				DA		DA			DA				D			DA
	Mobile App. Development	DA	D				DA	DA			DA	DA				D			DA
DA	S/w Artificial Intelligence						DA												
Data Analyst	Data Analytics with Python				DA								DA		DA				
	Data Visualisation									DA				DA	D				
IT Consultant	Entrepreneurship & Innovation							DA						DA				DA	DA
	Business Risk Analysis					DA				DA									DA
	Distributed Systems								DA		DA								

LEVEL 6																	
Programme Outcomes		Knowledge & Understanding				Cognitive/Intellectual Skills				Practical/Professional Skills				Key Transferable Skills			
Pathway	Module	A11	A12	A13	A14	B10	B11	B12	B13	C10	C11	C12	C13	D9	D10	D11	D12
Core	Synoptic Project & Dissertation	DA				DA	DA	DA		A	DA		DA		DA	A	DA
	Work Based Portfolio	D	DA	DA		A					A	DA		DA		DA	DA
	Research Skills & Academic Communications						DA		DA	DA	D				DA		
S/w Eng.	Enterprise Programming		DA														
	Software Quality Assurance					DA											
Data Analyst	Data Mining & Warehousing				DA						D						
	Big Data Analytics				DA												
IT Consultant	Data Analyst			DA								DA			A	DA	
IT Consultant	Emerging Technologies in Business	DA		DA					DA			DA			A		

Annexe 2: Level 6 Apprenticeship Standard for Digital & Technology Solutions Professional – degree apprenticeship

<https://www.instituteforapprenticeships.org/apprenticeship-standards/digital-and-technology-solutions-professional-degree/>

Core Skills (S)

S1: Information Systems: is able to critically analyse a business domain in order 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.

S2: Systems Development: analyses business and technical requirements to select and specify appropriate technology solutions. Designs, implements, tests, and debugs software to meet requirements using contemporary methods including agile development. Manages the development and assurance of software artefacts applying secure development practises to ensure system resilience. Configures and deploys solutions to end users.

S3: Data: identifies organisational information requirements and can model data solutions using conceptual data modelling techniques. Is able to implement a database solution using an industry standard database management system (DBMS). Can perform database administration tasks and is cognisant of the key concepts of data quality and data security. Is able to manage data effectively and undertake data analysis.

S4: Cyber Security: can undertake a security risk assessment for a simple IT system and propose resolution advice. Can identify, analyse and evaluate security threats and hazards to planned and installed information systems or services (e.g. Cloud services).

S5: Business Organisation: can apply organisational theory, change management, marketing, strategic practice, human resource management and IT service management to technology solutions development. Develops well-reasoned investment proposals and provides business insights.

S6: IT Project Management: follows a systematic methodology for initiating, planning, executing, controlling, and closing technology solutions projects. Applies industry standard processes, methods, techniques and tools to execute projects. 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.

S7: Computer and Network Infrastructure: can plan, design and manage computer networks with an overall focus on the services and capabilities that network infrastructure solutions enable in an organisational context. Identifies network security risks and their resolution.

Core Technical Knowledge (K)

Knows and understands:

K1: How business exploits technology solutions for competitive advantage.

K2: The value of technology investments and how to formulate a business case for a new technology solution, including estimation of both costs and benefits.

K3: Contemporary techniques for design, developing, testing, correcting, deploying and documenting software systems from specifications, using agreed standards and tools.

K4: How teams work effectively to produce technology solutions.

K5: The role of data management systems in managing organisational data and information.

K6: Common vulnerabilities in computer networks including unsecure coding and unprotected networks.

K7: The various roles, functions and activities related to technology solutions within an organisation.

K8: How strategic decisions are made concerning acquiring technology solutions resources and capabilities including the ability to evaluate the different sourcing options.

K9: How to deliver a technology solutions project accurately consistent with business needs.

K10: The issues of quality, cost and time for projects, including contractual obligations and resource constraints.

Core Behavioural Skills (B)

B1: Fluent in written communications and able to articulate complex issues.

B2: Makes concise, engaging and well-structured verbal presentations, arguments and explanations.

B3: Able to deal with different, competing interests within and outside the organisation with excellent negotiation skills.

B4: Is able to identify the preferences, motivations, strengths and limitations of other people and apply these insights to work more effectively with and to motivate others.

B5: Competent in active listening and in leading, influencing and persuading others.

B6: Able to give and receive feedback constructively and incorporate it into his/her own development and life-long learning.

B7: Applies analytical and critical thinking skills to Technology Solutions development and to systematically analyse and apply structured problem solving techniques to complex systems and situations.

B8: Able to 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.

B9: Able to conduct effective research, using literature and other media, into IT and business related topics.

B10: Have demonstrated that they have mastered basic business disciplines, ethics and courtesies, demonstrating timeliness and focus when faced with distractions and the ability to complete tasks to a deadline with high quality.

B11: Flexible attitude.

B12: Ability to perform under pressure.

B13: A thorough approach to work.

B14: Logical thinking and creative approach to problem solving.

Specialism Outcomes: Software Engineer

Skills

Be able to:

1: Create effective and secure software solutions using contemporary software development languages to deliver the full range of functional and non-functional requirements using relevant development methodologies.

2: Undertake analysis and design to create artefacts, such as use cases to produce robust software designs.

3: Produce high quality code with sound syntax in at least one language following best practices and standards.

4: Perform code reviews, debugging and refactoring to improve code quality and efficiency.

5: Test code to ensure that the functional and non-functional requirements have been met.

6: Deliver software solutions using industry standard build processes, and tools for configuration management, version control and software build, release and deployment into enterprise environments.

Technical Knowledge

Knows and understands:

7: How to operate at all stages of the software development lifecycle.

8: How teams work effectively to develop software solutions embracing agile and other development approaches.

9: How to apply software analysis and design approaches.

10: How to interpret and implement a design, compliant with functional, non-functional and security requirements.

11: How to perform functional and unit testing.

12: How to use and apply the range of software tools used in Software engineering.

Specialism Outcomes: Data Analyst

Skills

Be able to:

1. Import, cleanse, transform, and validate data with the purpose of understanding or making conclusions from the data for business decision making purposes.
2. Present data visualisation using charts, graphs, tables, and more sophisticated visualisation tools.

3. Perform routine statistical analyses and ad-hoc queries.
4. Use a range of analytical techniques such as data mining, time series forecasting and modelling techniques to identify and predict trends and patterns in data.
5. Report on conclusions gained from analysing data using a range of statistical software tools.
6. Summarise and present results to a range of stakeholders making recommendations.

Technical Knowledge

Knows and understands:

7. The quality issues that can arise with data and how to avoid and/or resolve these.
8. The processes involved in carrying out data analysis projects.
9. How to use and apply industry standard tools and methods for data analysis.
10. The range of data protection and legal issues.
11. The fundamentals of data structures, database system design, implementation and maintenance.
12. The organisation's data architecture.

Specialism Outcomes: IT Consultant

Skills

Be able to:

1. Perform technical process improvement tasks in a range of environments to solve business problems.
2. Present optimised solutions to improve business process and workflows through improved technology.
3. Recommend options based upon risks, costs vs benefits, and impact on other business processes.
4. Participate in walk-throughs for IT, to identify and document key risks within a client's organisation.

5. Support training of end-users in preparation for system activation.
6. Evaluate the success of a new system, process, initiative, etc.

Technical Knowledge

Knows and understands:

7. How consulting ties into project management, business analysis and business management.
8. The barriers to solving problems or maximizing opportunities.
9. How to present recommendations and influence action.
10. The different structured process approaches for digital technology consulting.
11. How to frame/define business problems objectively before solving them. ☐ How to discover hidden requirements using probing techniques to establish trust, using open and closed questions

Annex 3 : Curriculum mapping against the apprenticeship standard

Level 4																																
Apprenticeship Standards		Core Skills (S)						Core Technical Knowledge (K)										Core Behavioural Skills (B)														
		S1	S2	S3	S4	S5	S6	S7	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14
Pathway	Module																															
Core	Computer Programming										X																					
	SDLC & Project Management		X				X				X																					
	Database Systems			X																												
	Ethics & Commercial Reasoning																		X	X			X				X	X				
S/W Eng.	Data Structure and Algorithms																							X								X
IT Consult	S/W Eng.		X																													
	Data Analyst											X																				

LEVEL 4																																						
Specialism Standard		Software Engineer												Data Analyst												IT Consultant												
		Skills						Technical Knowledge						Skills						Technical Knowledge						Skills						Technical Knowledge						
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Pathway	Module																																					
Core	Computer Programming	x		x	x					x							x																					
	SDLC & Project Management	x	x					x	x	x			x																			x						
	Database Systems							x																x														
	Ethics & Commercial Reasoning																							x														
S/W Eng.	Data Structure and Algorithms									x																												
IT Consult	S/W Eng.						x						x		x																							
	Data Analyst													x	x		x	x																				
																x																						

LEVEL 5																																
Apprenticeship Standards		Core Skills (S)							Core Technical Knowledge (K)										Core Behavioural Skills (B)													
		S1	S2	S3	S4	S5	S6	S7	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14
Pathway	Module																															
Core	Networking & Security				X			X						X																		
	User Interface Design										X													X								
	Data Analytics and Business Insights			X						X			X												X							
S/w Eng.	Advanced Programming										X																					
	Web Design & Authoring			X																				X								
	Mobile App. Development			X																				X								
DA	S/w	X																														X
Data Analyst	Data Analytics with Python										X																					
	Data Visualisation												X																			
IT Consultant	Entrepreneurship & Innovation					X											X		X				X									
	Business Risk Analysis					X				X									X													
	Distributed Systems			X										X																		

LEVEL 5																																					
Specialism Standard		Software Engineer												Data Analyst												IT Consultant											
		Skills						Technical Knowledge						Skills						Technical Knowledge						Skills						Technical Knowledge					
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Pathway	Module																																				
Core	Networking & Security																																				
	User Interface Design		X							X	X																										
	Data Analytics and Business Insights		X							X	X								X	X					X												
S/w Eng.	Advanced Programming	X		X	X					X				X																							
	Web Design & Authoring	X	X								X																										
	Mobile App. Development	X	X								X																										
DA	S/w	X														X					X																
Data Analyst	Data Analytics with Python																X			X	X																
	Data Visualisation													X	X	X		X	X																		
IT Consultant	Entrepreneurship & Innovation																																X	X			
	Business Risk Analysis																								X		X				X						
	Distributed Systems																									X		X									

LEVEL 6																																
Apprenticeship Standards		Core Skills (S)							Core Technical Knowledge (K)										Core Behavioural Skills (B)													
		S1	S2	S3	S4	S5	S6	S7	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14
Pathway	Module																															
Core	Synoptic Project & Dissertation						X				X			X			X		X	X	X	X		X				X	X	X	X	
	Work Based Portfolio	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Research Skills & Academic Communications																		X	X			X				X					
S/w Eng.	Enterprise Programming			X																				X								
	Software Quality Assurance		X								X																					
Data Analyst	Data Mining & Warehousing			X									X																			
	Big Data Analytics			X									X																			
IT Consultant	Data Analyst															X	X								X	X						
IT Consultant	Emerging Technologies in Business	X				X			X	X														X	X							

LEVEL 6																																					
Specialism Standard		Software Engineer												Data Analyst												IT Consultant											
		Skills						Technical Knowledge						Skills						Technical Knowledge						Skills						Technical Knowledge					
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Pathway	Module																																				
Core	Synoptic Project & Dissertation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Work Based Portfolio						X	X																													
	Research Skills & Academic Communications																																				
S/w Eng.	Enterprise Programming	X		X	X		X						X																								
	Software Quality Assurance				X	X					X		X																								
Data Analyst	Data Mining & Warehousing														X		X		X					X													
	Big Data Analytics															X		X		X				X													
IT Consultant	Data Analyst																												X	X					X	X	X
IT Consultant	Emerging Technologies in Business																									X	X			X				X			