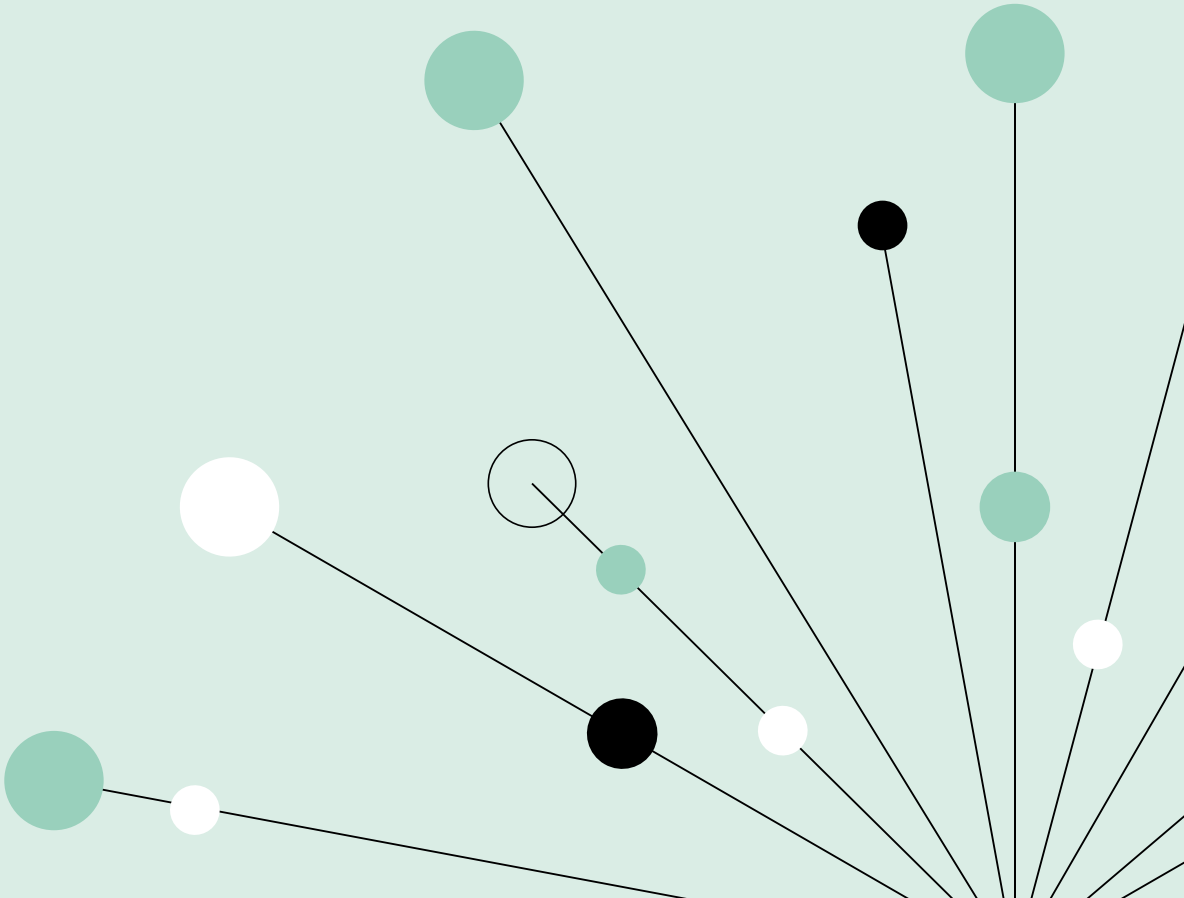
QA | In partnership with Northumbria University NEWCASTLE

Apprenticeships England

BSc Digital & Technology Solutions

Degree Apprenticeship

Programme Guide



QA.com

Why QA?

Endorsed by 4,000+ global clients, we are the leader in applied and cohort-based learning academies.

Today's biggest technological shifts are shaped by AI, cloud, and data.

In every technology revolution, there are winners and losers – and teams with applied skills make all the difference. We believe you can't change an organisation unless you change the capabilities of its people and ensure human and machine intelligence work together.

Success in numbers:

40+
Years of training experience

1,000+
AI, cloud & coding hands-on labs

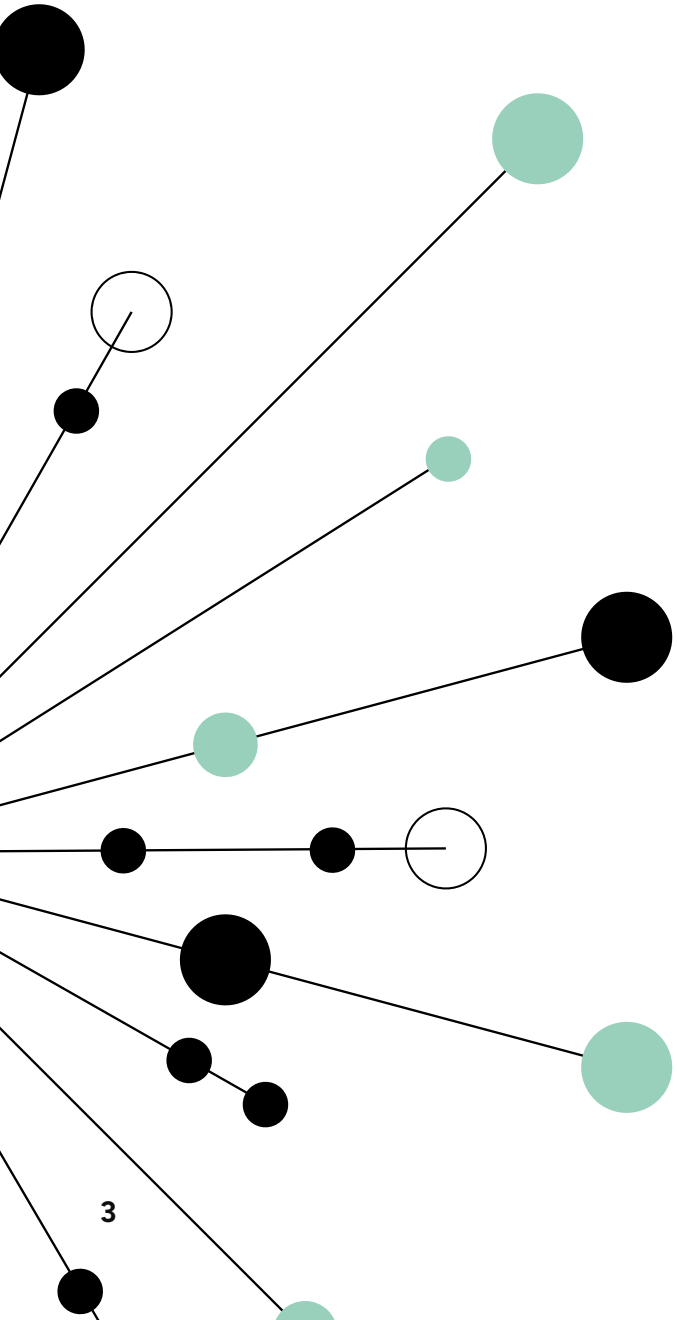
50,000+
Careers launched & accelerated

£500M+
Levy spend invested

20 days
Feedback time for submissions

6
Specialist learning pathways in BSc

Ready to explore how QA can support you?
Let's dive in!



Contents

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Creating Change

Build a pipeline of future leaders in technology.

This programme develops adaptable digital professionals equipped to drive innovation within your organisation.

It provides a strong foundation in computing, critical thinking, and problem-solving to deliver impactful, data-driven solutions aligned with strategic goals.

By fostering professional growth, adaptability, and collaboration, it enables teams to achieve excellence and enhance performance.

Our degree apprenticeships drive business results by enabling organisations to apply skills quickly, consistently, and at scale.

Academic Excellence

In the Complete University Guide 2025, Northumbria ranks 34th in the UK.

Digital Ambitions

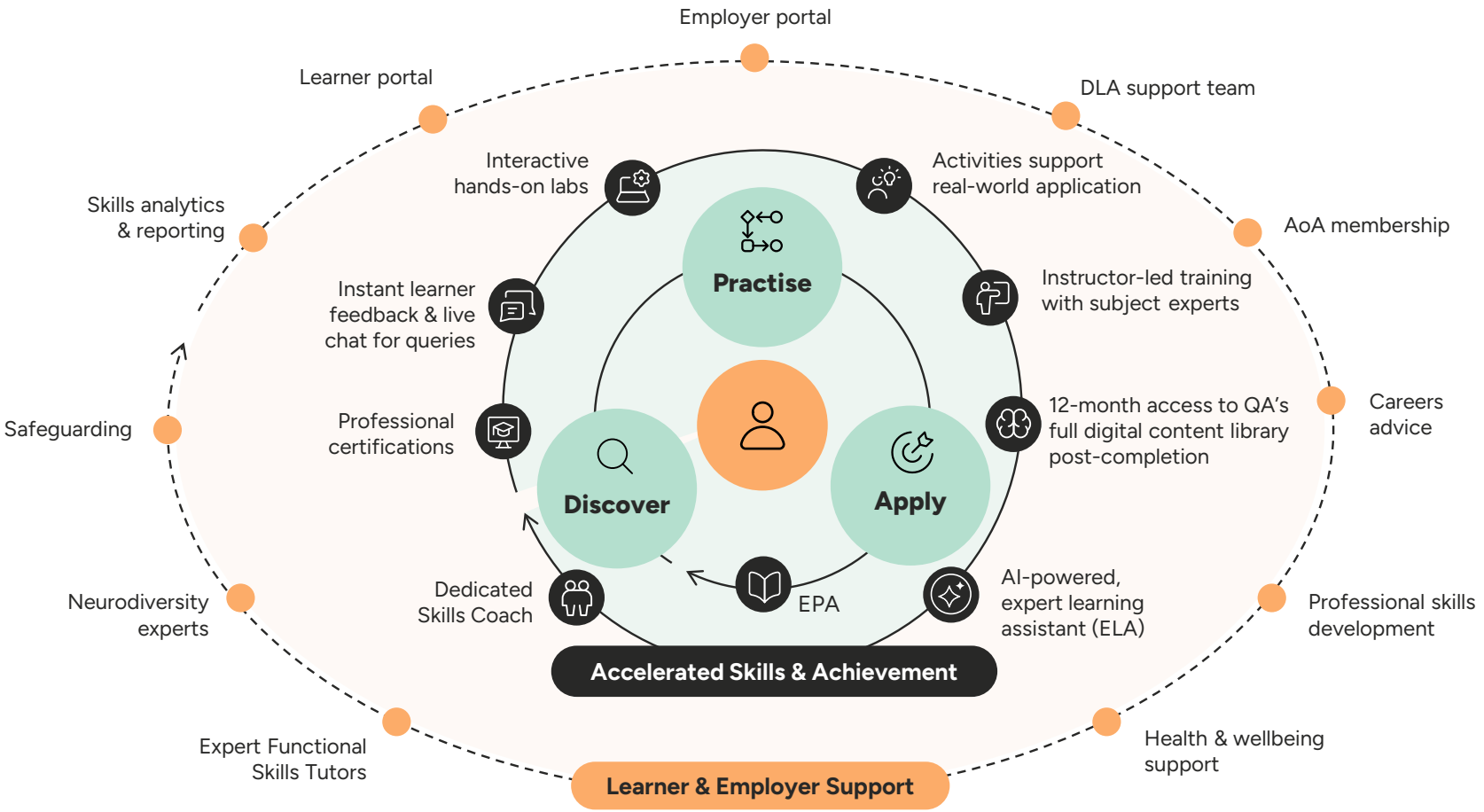
Cultivate a learning culture that enhances skills, builds expertise, and prepares for the future.

Industry Certification

Choose certifications from Microsoft, AWS, GCP, Salesforce, or ServiceNow.

Digital by Design

Our market-leading approach accelerates skill development and achievement through our **Discover**, **Practise**, **Apply** methodology, ensuring that both learners and employers are fully supported throughout their programme.



Discover

Leveraging QA's learning platform, learners follow a development path focused on their job role.

Practise

Learners join instructor-led sessions, practise skills in hands-on, risk-free labs, and collaborate with peers.

Apply

Learnings are applied on the job through work-based activities at key stages, supported and reviewed by specialist skills coaches.

Programme Overview

Details of standard: BSc (Hons) Digital & Technology Solutions

Total cost: £27,000

Programme duration: 41 months

Live instructor sessions: 44 days

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Vendor training and certifications available in degree apprenticeship:

Microsoft Solutions Partner – Microsoft Cloud – Training Services

aws PARTNER Advanced Tier Training

Google Cloud Partner

salesforce authorised training provider

servicenow

Specialist Pathways

- IT Consultant
- Data Analyst
- Business Analyst
- Software Engineer
- Network Engineer
- Cyber Security

Experience QA's self-paced learning with interactive labs and AI-powered learning assistant.

Learner Journey

The Digital & Technology Solutions programme is Tech Industry Gold accredited and aligns with the British Computer Society's Registered IT Technician (RITTech).

This degree apprenticeship integrates live and online workshops with self-paced learning, employing a guided discovery approach for individual learner contexts.

It uses research-informed methods to help learners translate theoretical knowledge into practical skills.

Learners are assigned a Digital Learning Consultant (DLC) for personalised coaching and support. These specialists ensure their successful progress, wellbeing, and readiness for assessments.

ACE Team

Our Academic Community of Excellence (ACE) team support learners with writing styles, reading strategies, referencing, and more.

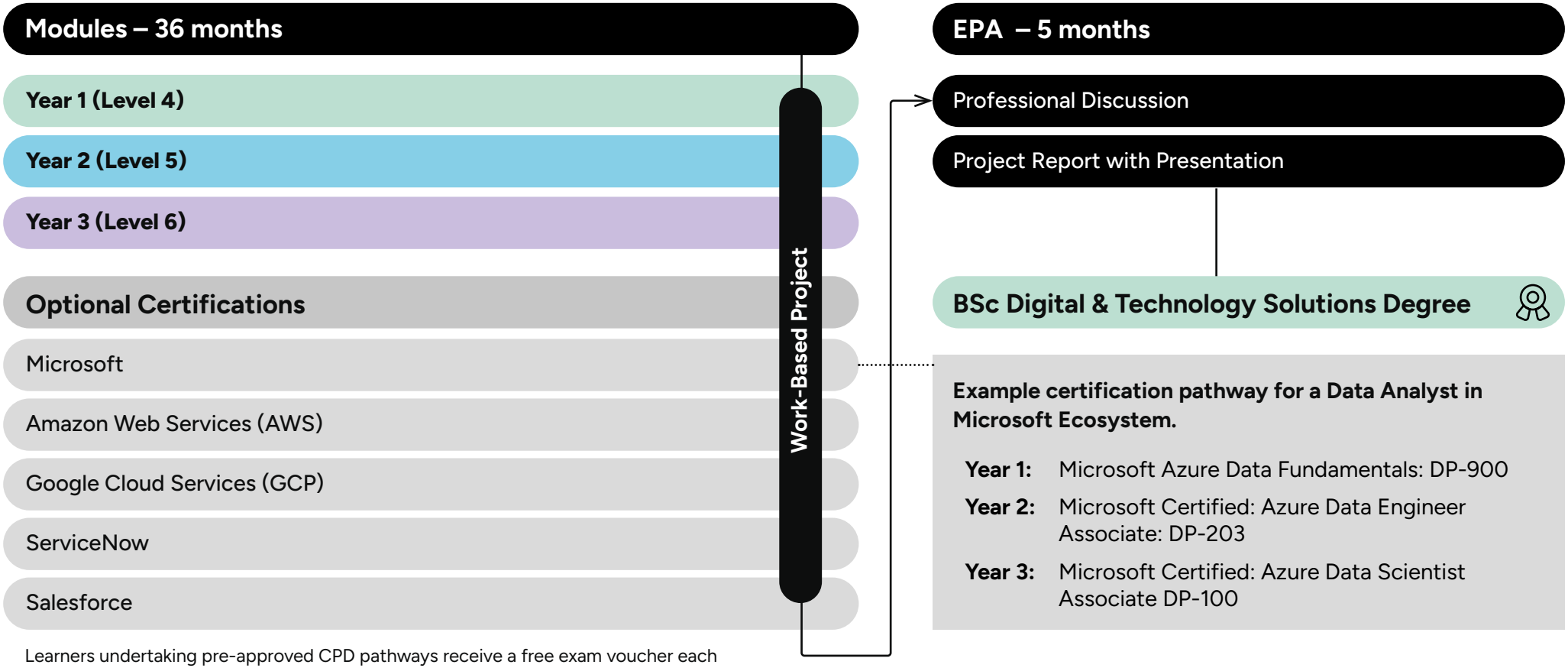
Learner Enrichment

- Industry-led Events & Masterclasses
- Tech Industry Gold Platform Membership
- Tech Industry Gold Certified Credentials

tech industry gold
accredited by TechSkills

Learners can access Northumbria University Library – all essential and recommended readings are provided free of charge as e-books.

Enhance the learner journey with industry-recognised certifications, vendor training, and access to the QA learning platform.



Learners undertaking pre-approved CPD pathways receive a free exam voucher each academic year, excluding ServiceNow training and certification, which is subsidised.

Entry Criteria

Standard Entry

- Full-time employment in a relevant role
- Level 3 qualifications in STEM subjects (e.g., 2 A Levels, BTEC Diplomas, Apprenticeship, or equivalent)

Non-Standard Entry

- Relevant qualifications and/or work experience will be considered for applicants with potential to benefit from the programme

Module Key: ☐ Fixed ● Subject to Rotation

Year 1 - Level 4	Year 2 - Level 5	Year 3 - Level 6
Module 1: Technology in the Organisational Context (10 weeks) ☐	**Module 1:** Business Systems & Processes (10 weeks) ☐	**Module 1:** Practical Research Proposal (10 weeks) ☐
Module 2: Software Engineering Fundamentals (20 weeks) ☐	**Module 2:** Cloud Solutions & Architecture (20 weeks) ☐	**Module 2:** Contemporary Issues in Digital Technology (20 weeks) ☐
Module 3: IT Project Management (10 weeks) ●	**Module 3:** Cyber Security Fundamentals (10 weeks) ●	**Module 3:** Developing Technology Strategy (10 weeks) ●
Module 4: Professional Practice & Portfolio Development 1 (20 weeks) ☐	**Module 4:** Professional Practice & Portfolio Development 2 (20 weeks) ☐	**Module 4:** Professional Practice & Portfolio Development 3 (20 weeks) ☐
Module 5: Data Modelling & Database Design (10 weeks) ●	**Module 5:** Practical Data Analytics (10 weeks) ●	**Module 5:** Specialist Pathway* (10 weeks) ●
Module 6: Data Communications & Network Security (10 weeks) ●	**Module 6:** Specialist Pathway* (10 weeks) ●	**Module 6:** Major Project (10 weeks) ☐

*Specialist Pathways

IT Consultant	Business & Delivering Change	Consulting
Data Analyst	Principles of Data Science	Applied Data Modelling & Visualisation
Business Analyst	Requirements Engineering for Business Analysis	Advanced Business Strategy & Solution Analysis
Software Engineer	Software Engineering & Agile	Software Engineering & DevOps
Network Engineer	Switching & Routing	Advanced Network Design
Cyber Security	Cyber Security Strategy & Implementation	Advanced Cyber Security Incident Response

Modules – Year 1

All Level 4 modules are core and each worth 20 credits.

01

Module 1:
Technology in the Organisational Context

Establishes the foundation for the programme by providing the essential academic skills and a framework for advanced study.

It explores the strategic role of technology in enhancing competitive advantage and the complexities of managing rapidly evolving technologies and their impacts on business practices and digital transformation.

Topics:

- Introduction to Information Systems (IS)
- IS for Enterprise Systems
- The Impact of IS on the Organisation & Business Strategy
- Knowledge Management & Business Intelligence
- The Information Systems Strategy Triangle
- Information Security & Governance
- Ethical & Social Issues in IS
- The Future of Technology in Business

Live Instructor Sessions: 4 Days
(8 Half-Day Workshops)

02

Module 2:
Software Engineering Fundamentals

Builds essential programming and software development skills for all IT pathways – with a focus on Python, data processing, and code management.

Topics:

- Software Design & Development
- Introduction to Python
- Flow Control
- Working with Data Collection in Python
- Building Applications & Reusing Code
- Source Control & Software Development
- Testing
- AI in Software Development

Live Instructor Sessions: 3 Days
(6 Half-Day Workshops)

03

Module 3:
IT Project Management

Emphasises project management in building IT learning communities – including problem evaluation, selecting optimal solutions, and managing IT projects independently and in teams.

Topics:

- Fundamental Concepts in Project Management
- Project Management & Organisational Context
- Management & Team Building
- Scope & Management
- Project Scheduling
- Costing Estimation & Budgeting
- Risk Management
- Emergent Themes in Project Management

Live Instructor Sessions: 4 Days
(8 Half-Day Workshops)

04

Module 4:
Professional Practice & Portfolio Development 1

Enhances professional growth through self-guided learning, reflective models, and skills analysis. These acquired skills are applied to a real-world project to provide context and practical experience.

Topics:

- Continuous Professional Development
- Structured Online Learning
- Mini Project
- Other Approved Forms

Live Instructor Sessions: 1 Day
(2 Half-Day Workshops)

05

Module 5:
Data Modelling
& Database Design

Covers data management and modelling techniques to address organisational information requirements, using industry-standard DBMS to implement relational and non-relational database solutions.

Topics:

- Introduction to Data Modelling
- Logical & Physical Data Modelling
- Normalisation
- Types of Databases
- SQL & Relational Database Management Systems
- Displaying Data & Using Functions
- Joins, Summarised Queries & Subqueries
- Maintaining Data & Database Objects

Live Instructor Sessions: 4 Days
(8 Half-Day Workshops)

06

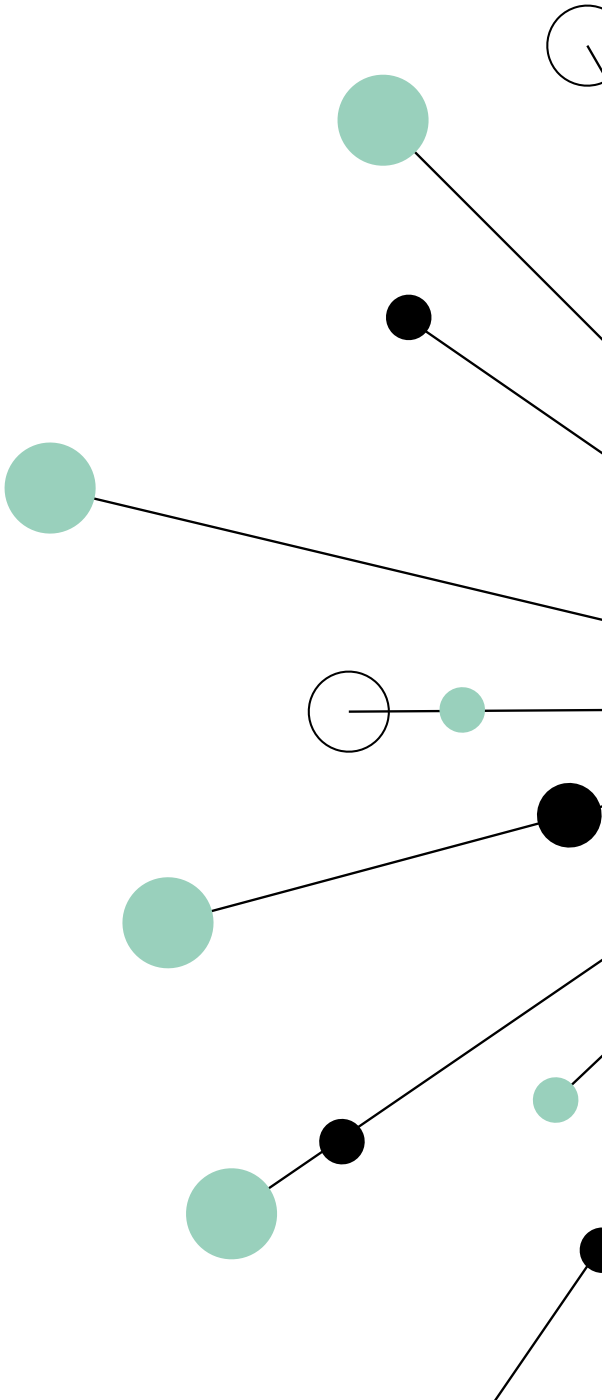
Module 6:
Data Communications
& Network Security

Examines core networking principles like TCP/IP, LAN/WAN, and protocol layering, with a focus on security – addressing foundational protocols, vulnerabilities, threat landscapes, and critical controls to safeguard IT systems.

Topics:

- Explore Network Capabilities
- Architecture of Networks
- Introduction to Routing
- Network Services
- Wide Area Networks
- Connectivity & Remote Access Technologies
- Network Security
- Network Access Control & Threats

Live Instructor Sessions: 4 Days
(8 Half-Day Workshops)



Modules – Year 2

All Level 5 modules are core with one specialist pathway – each worth 20 credits.

01

Module 1:
Business Systems & Processes

Develops skills to analyse, improve, and align business processes with strategy – focusing on driving change, performance measurement, software tools, and adapting to future trends in digital transformation.

Topics:

- Introduction to Business Process Improvement
- Defining Process Hierarchy & Scope
- Modelling the as-is Business Processes
- Measuring Process Performance
- Developing the to-be Business Processes
- Using Software Tools to Support Business Process Improvement
- Continuous Process Management
- Future Trends in Business Process Improvement

Live Instructor Sessions: 3 Days
(6 Half-Day Workshops)

02

Module 2:
Cloud Solutions
& Architecture

Explores skills and knowledge to design, implement, and manage secure, scalable cloud solutions, covering core concepts, business value, security, and industry best practices in cloud computing.

Topics:

- Introduction to Cloud Computing
- Cloud Service & Deployment Models
- Cloud Service Providers
- The Cost & Business Value of Cloud Computing
- Designing & Adopting Cloud Solutions
- Cloud Storage & Archiving
- The Security Implications of Cloud Solutions
- Cloud Best Practices & the Future of Cloud

Live Instructor Sessions: 2 Days
(4 Half-Day Workshops)

03

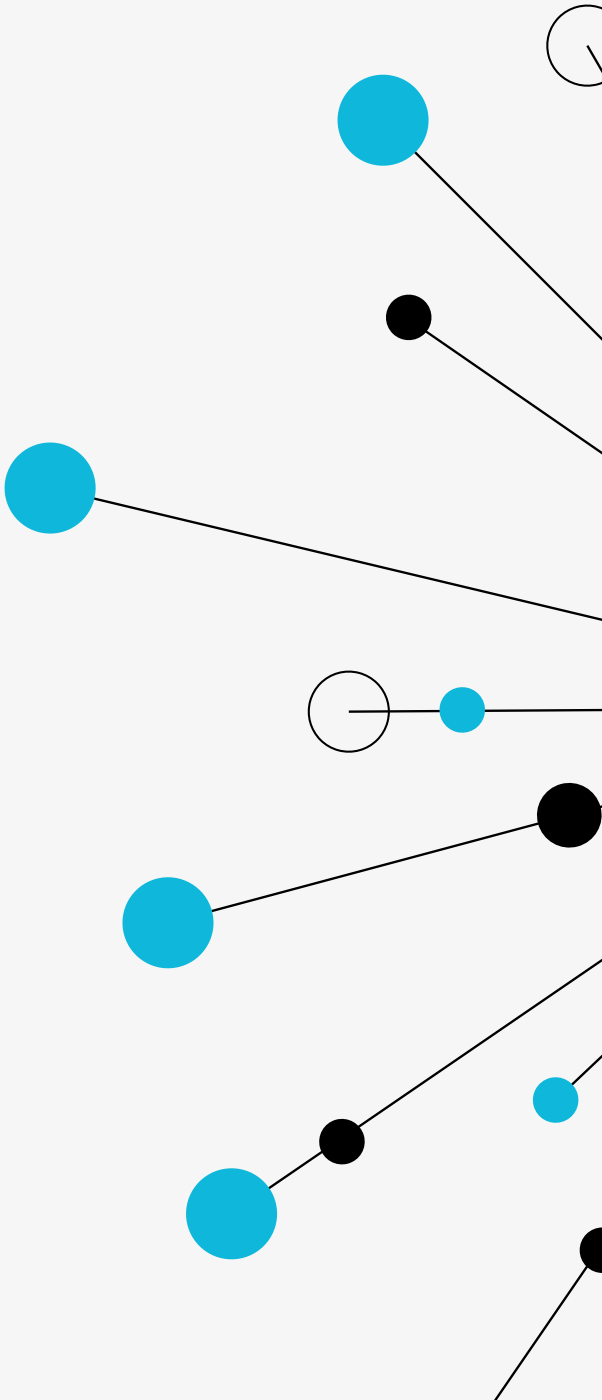
Module 3:
Cyber Security
Fundamentals

Examines cyber security fundamentals with a focus on risk analysis and mitigation, exploring system vulnerabilities, adversary tactics, security culture, governance, and strategies to protect data and ensure business continuity.

Topics:

- Cyber Security & Information Security Foundation
- Networking & Modern Communications
- Encryption
- Cloud Security
- Risk Management
- Identity Services & Social Engineering
- Security Testing & Monitoring
- Business Continuity & Disaster Recovery

Live Instructor Sessions: 3 Days
(6 Half-Day Workshops)



04

Module 2:
Professional Practice & Portfolio Development 2

Enhances professional growth through self-guided learning, reflective models, and skills analysis. These acquired skills are applied to a real-world project to provide context and practical experience.

Topics:

- Continuous Professional Development
- Structured Online Learning
- Mini Project
- Other Approved Forms

Live Instructor Sessions: 1 Day
(2 Half-Day Workshops)

05

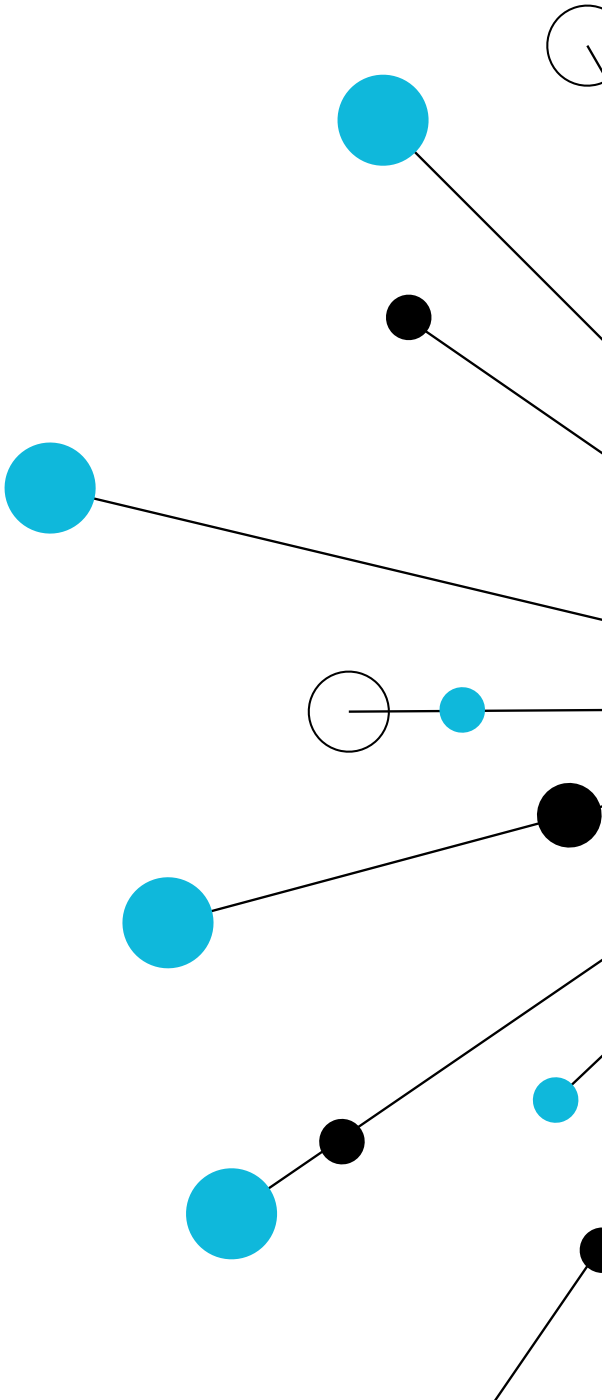
Module 5:
Practical Data Analytics

Focuses on data architectures and analytics to meet organisational needs, covering data modelling, warehousing, big data handling, and skills to analyse internal and third-party behaviour for actionable strategic insights.

Topics:

- Data Analysis Questions & Methods
- Statistical Approaches of Data Interpretation
- Preparing Data for Analysis
- Visualising Data to Communicate Insight
- Data Architecture: Small to Medium Data
- Challenges & Opportunities of Big Data
- Data Architecture: Big Data
- Data Storytelling with Big Data Insights

Live Instructor Sessions: 3 Days
(6 Half-Day Workshops)



06 Module 6:
Specialist Pathway

IT Consultant

Business & Delivering Change

Covers business transformation, focusing on problem-solving techniques and analytical abilities to help businesses adapt to complex environments, while encouraging the application of these concepts in professional practice.

Topics:

- Business Strategy, Technology & Change
- Approaches to Business Change
- Exploring Business Problems
- Evaluating Change Options
- Assessing the Impact of Change
- Planning for Change
- Implementing Change
- Change Leadership & Future Trends

Data Analyst

Principles of Data Science

Explores the data science lifecycle from collection to deep learning, focusing on machine learning algorithms including regression, classification, clustering, and model optimisation to effectively apply data analysis solutions.

Topics:

- The Data Project Lifecycle
- The Machine Learning Pipeline
- Data Exploration & Preparation
- Regression
- Classification
- Clustering & Association Rules
- Model Optimisation
- Deployment

Business Analyst

Requirements Engineering for Business Analysis

Builds skills in gathering, analysing, and managing business requirements from elicitation to retirement. Emphasises collaboration, process modelling, and change control, with a focus on quality assurance and real-world application.

Topics:

- Requirements Elicitation & Collaboration Techniques
- Approaches to Requirements Lifecycle Management
- Business Process Analysis & Modelling
- Investigative Techniques in Business Analysis
- Change Control Methods & Versioning Practices
- Quality Assurance in Requirements Management
- End-to-end Requirements Lifecycle
- Applying Business Analysis Techniques in Practice

Live Instructor Sessions: 3 Days
(6 Half-Day Workshops)

06 Module 6:
Specialist Pathway

Software Engineer

Software Engineering & Agile

Delves into advanced software engineering and Agile methodologies – covering application development, source control, continuous integration, automated testing, and iterative practices for modern systems and product development.

Topics:

- Object-Oriented Programming & Agile Methodology
- Data Operations, APIs & Scrum
- Modern Software Architecture & Front-End Essentials
- Agile Task & Software Development Management
- Backing Services, Backlog & Sprint Planning
- Developing Software Applications & Agile Retrospectives
- Software Testing & Introduction to DevOps Culture
- DevOps: CI & Agile Frameworks

Network Engineer

Switching & Routing

Examines Layer 2 Ethernet protocols, Cisco switching technologies, VLANs, IP routing (RIP, EIGRP, OSPF), network segmentation, security, and monitoring, with a focus on network design, trunking, and redundancy principles.

Topics:

- Principles of Network Design & Implementation
- Subnets
- Layer 2 Redundancy
- Virtual Local Area Networks (VLANs)
- Routing Protocols
- Wireless Networking
- Network Security
- Network Monitoring

Cyber Security

Cyber Security Strategy & Implementation

Focuses on developing and applying cyber security strategies using key frameworks and standards. Covers risk assessment, resilient system design, governance, and compliance to build secure architectures that meet organisational and legal requirements.

Topics:

- Cyber Security Frameworks & Standards
- Risk Management & Assessment
- Incident Response & Management
- Security Policies & Governance
- Threat Intelligence & Analysis
- Secure System Requirements, Design & Architecture
- Compliance & Legal Issues
- Cyber Security Strategy Development

Live Instructor Sessions: 3 Days
(6 Half-Day Workshops)

Modules – Year 3

All Level 6 modules are core, with one specialist pathway.
Module 1 is 10 credits, Module 6 is 30 credits, and others are 20 credits.

01

Module 1:
Practical Research Proposal

Explores the intersection of professional interests and organisational goals to create an impactful research proposal. From research methods, proposal writing, and reporting in technical contexts – enhancing workplace improvement and major project outcomes.

Topics:

- Introduction to Research Projects in a Computing Environment
- Reviewing Literature
- Gap Analysis
- Goals, Aims & SMART Objectives
- Appropriate Methodologies & Methods for Conducting Research
- Ethical & Legal Implications
- Findings, Analysis & Evaluation
- The Major Project & End-Point-Assessment

Live Instructor Sessions: 1 Day
(2 Half-Day Workshops)

02

Module 2:
Contemporary Issues
in Digital Technology

Covers current digital technology trends – including AI, blockchain, and sustainability, focusing on adapting skills and knowledge to address evolving challenges in the computing and business landscape.

Topics:

- Introduction to Contemporary Issues & Action Research
- Artificial Intelligence
- Adapting Working Practices
- Blockchain Technology
- The Digital Divide
- Sustainability
- Data Security
- Emerging Issues

Live Instructor Sessions: 1 Day
(2 Half-Day Workshops)

03

Module 3:
Developing
Technology Strategy

Develops technology strategies to drive competitive advantage, applying frameworks to business contexts, solving organisational problems, and aligning solutions with strategic goals across cross-functional teams.

Topics:

- Overview of Technology Strategy
- Approaches to Support Innovation
- Organisational Problems, Causes & Solutions
- Opportunity Definition, Justification & Professionalism
- Appraisal of Proposed Solutions
- Analysis & Evaluation of Impact of Proposed Solution
- Illustration of Outcome of Proposed Solutions
- Goal Settings, Migration & Implementation

Live Instructor Sessions: 2 Days
(4 Half-Day Workshops)

04

Module 4:
Professional Practice & Portfolio
Development 3

Enhances professional growth through self-guided learning, reflective models, and skills analysis. These acquired skills are applied to a real-world project to provide context and practical experience.

Topics:

- Continuous Professional Development
- Technical Training (Workplace or Classroom)
- Structured Online Learning
- Mini Project
- Other Approved Forms

Live Instructor Sessions: 1 Day
(2 Half-Day Workshops)

05 Module 5:
Specialist Pathway

IT Consultant

Consulting

Enhances theoretical and practical consultancy skills in complex business environments. It covers problem-solving techniques to help businesses adapt to changing conditions and encourages applying these concepts to real-world situations to build expertise.

Topics:

- Consultancy & Wider Context of the Consulting Process
- The Seven Cs of Consulting
- Evaluating Client Capabilities & Business Opportunities
- Challenges in the Consulting Process
- Creative Approaches for Developing Solutions
- Managing Projects
- Key Personal Skills for Consultants
- Deploying the Change

Data Analyst

Applied Data Modelling & Visualisation

Applies data modelling and algorithms to uncover insights, identify opportunities, and assess risks. Emphasises data sourcing, analysis, predictive modelling, and visualisations to communicate insights and support data-driven decisions.

Topics:

- Data Visualisation with Python
- Deep Learning
- Time Series Analysis & Forecasting
- Optimising Time Series Model
- Natural Language Processing
- Sentiment Analysis
- Interactive Graphs with Plotly
- Compiling & Embedding Dashboards

Business Analyst

Advanced Business Strategy & Solution Analysis

Focuses on aligning business needs with strategic solutions – evaluating performance through benchmarking, while ensuring compliance with legislation and standards. Emphasises practical application of analysis tools to drive measurable value and lasting improvement.

Topics:

- Strategy Analysis & Aligning Business Needs
- Developing & Presenting Business Cases
- Effective Use Cases for Business Solutions
- Solution Evaluation & Benchmarking
- Tools & Techniques for Business Analysis
- Legislation & Industry Standards
- Compliance & Governance in Practice
- Applying Strategy Analysis & Solution Implementation

Live Instructor Sessions: 2 Days
(4 Half-Day Workshops)

05 Module 5:
Specialist Pathway

Software Engineer

Software Engineering & DevOps

Explores software engineering and DevOps skills to analyse requirements, build secure applications, and unify development and operations, enabling faster, collaborative software creation and deployment aligned with organisational goals.

Topics:

- Introduction to DevOps
- Containerising a Cloud-Native Application
- Adopting a Continuous Testing Approach
- Securing the Pipeline
- Building Complex & Secure Applications
- Choosing a Cloud Environment
- Deploying the Application
- Monitoring the Application

Network Engineer

Advanced Network Design

Examines advanced network design, focusing on analysing requirements, evaluating options, and developing scalable, secure solutions. Covers infrastructure, redundancy, QoS, automation, SDN, IoT, and emerging technologies to optimise performance and objectives.

Topics:

- Principles of Network Design
- Network Redundancy
- Quality of Service (QoS)
- Network Management & Monitoring
- Network Automation & Configuration Management
- Wireless Network Design
- Software Defined Networking
- Designing for the Internet of Things (IoT)

Cyber Security

Advanced Cyber Security Incident Response

Develops expertise in responding to cyber incidents, with a focus on supporting digital forensic analysis. Covers legal, ethical, and professional responsibilities, evidence handling, risk management, and applying improvements to incident response processes.

Topics:

- Introduction to Incident Handling
- Incident Management & Response
- Network Analysis, Physical Memory Analysis & Secure Programming
- Open-Source Threat Intelligence
- Risk Calculation & Management
- Intrusion Analysis
- Cloud & Mobile Device Security
- Evidence Disclosure & Security Policies within UK Legal Framework

Live Instructor Sessions: 2 Days
(4 Half-Day Workshops)

06

Module 6:
Major Project

The final component – showcasing key skills, knowledge, and behaviours.

It involves an individually negotiated business project, independent research with advanced methods, and a final presentation to assess outcomes.

Topics:

- Methodology Undertaken
- Design Stages
- Implementation Approach
- Results Evaluation
- Areas of Future Work

Live Instructor Sessions: 2 Days
(4 Half-Day Workshops)

Tools and Technologies

Development Tools

- Python 3
- JetBrains PyCharm
- Git
- Visual Studio Code
- Anaconda Distribution
- Docker Desktop
- Burp Suite

Networking Tools

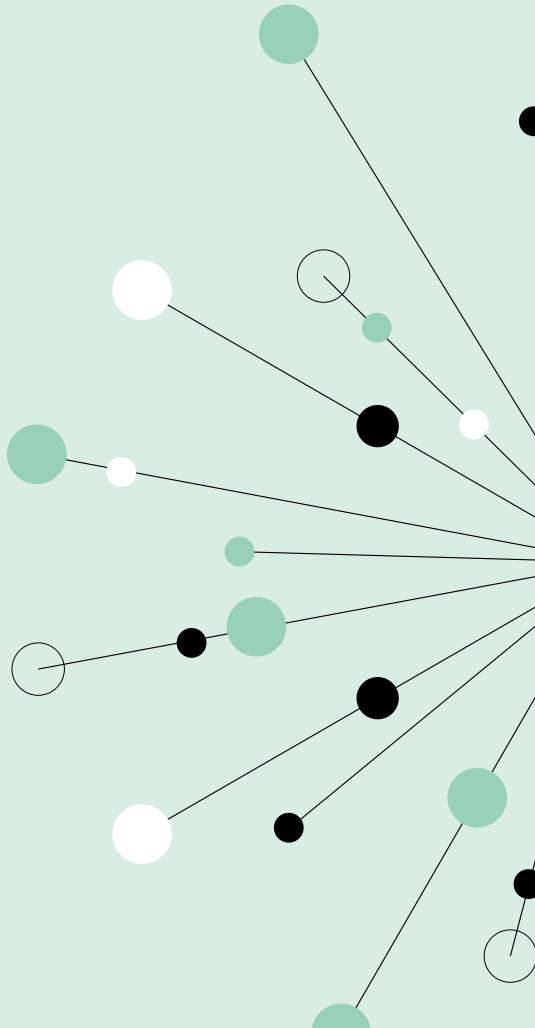
- Cisco Packet Tracer (V8.2)
- GNS3
- Hyper-V (as applicable)

Data and Analytics Tools

- Microsoft SQL Server (Express Edition)
- SQL Server Management Studio
- Power BI
- Microsoft Excel

Collaboration and Office Tools

- Google Workspace



End-Point-Assessment

We ensure all learners are fully prepared for their End-Point-Assessment (EPA) through our internal gateway process, maximising their success rates.

Assessment criteria:

01

Knowledge
Ability to convey knowledge effectively.

02

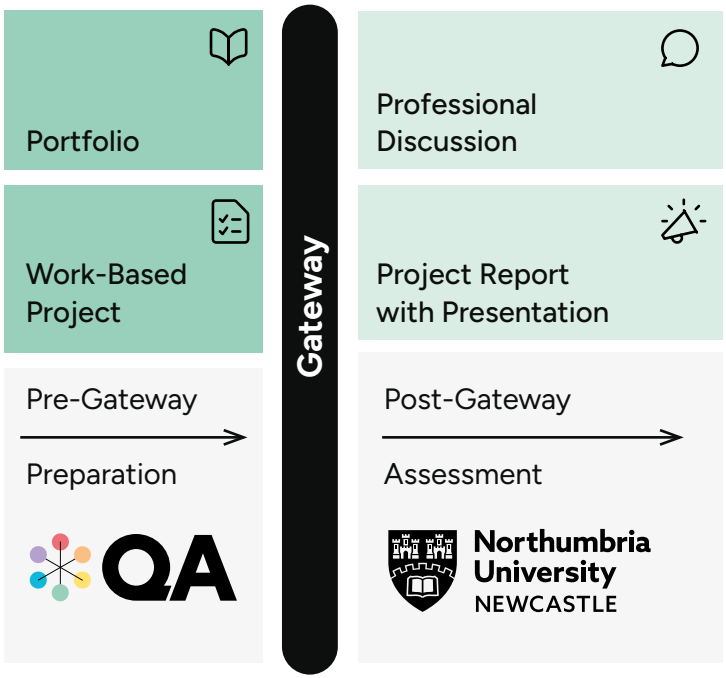
Skills
Demonstrate practical skills with confidence.

03

Behaviour
Exhibit professional workplace behaviour.

Explore the detailed assessment criteria withing the **Digital & Technology Solutions standard**.

EPA process:



Professional Discussion:
Engage in a formal two-way conversation to showcase knowledge, skills, and behaviours.

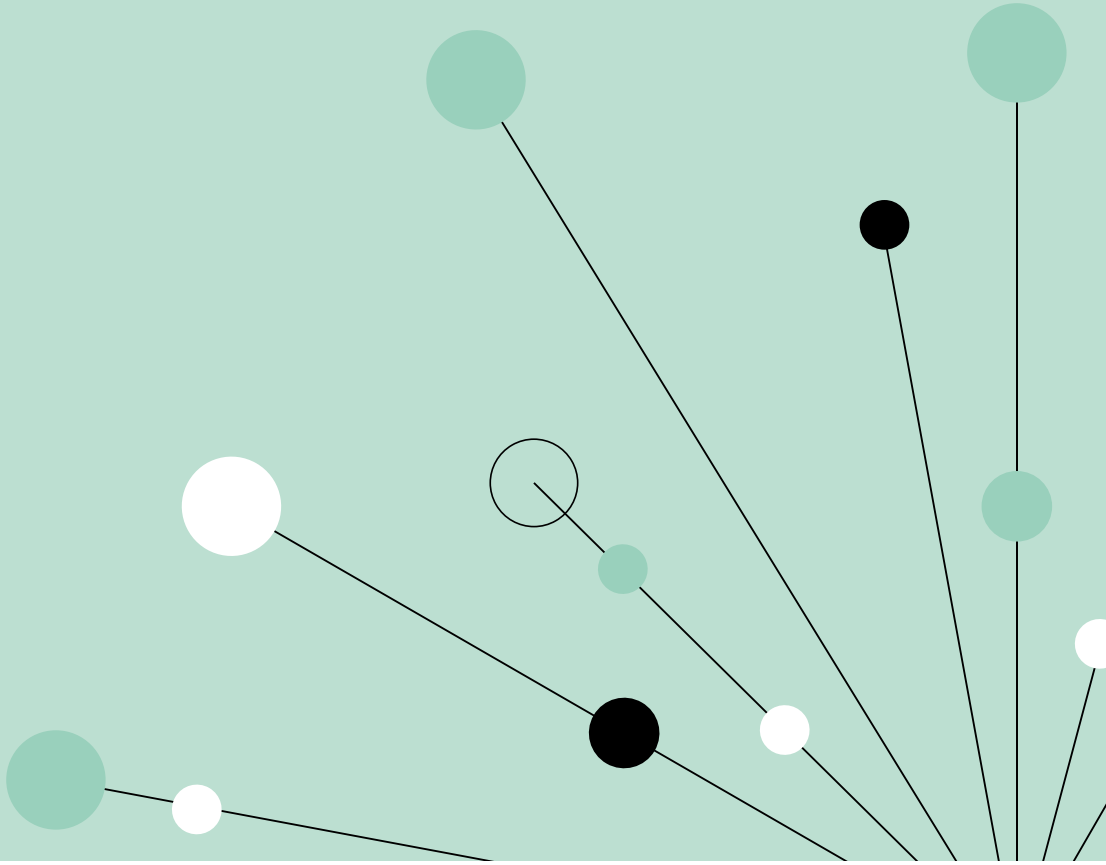
Project Report with Presentation: Prepare a project report, demonstrate achievements and knowledge, and participate in a Q&A.

Ready to partner with us?

Let's talk:

0113 220 7150

qa.com/contact



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