POWERING POTENTIAL

Apprenticeship Programme Guide

SOFTWARE ENGINEER

Level 4

QA.com

DIGITAL AND DEGREE APPRENTICESHIPS

Building tech careers in the workplace

We offer digital and degree apprenticeships that focus on the most in-demand tech skills including; cyber, IT, software development, data and digital marketing, along with others in project management and artificial intelligence (AI).

With programme pathways from Level 3 – Level 7, we help learners to progress and grow within your company, helping you retain talent and build capabilities.

Our award-winning approach to blended learning enables apprentices to develop further and faster, adding immediate value to their roles, whilst our interactive portal with real-time dashboards and trigger alerts enable managers to effectively and efficiently track progress.

Experience: 30,000 apprenticeships placed

An unrivalled talent pool: 100,000 apply to join our programmes every year

Award-winning: Recipient of the Gold Award at the Learning Tech Awards 2020 for our apprenticeship delivery model

98% Higher than average provider performance with a pass rate of 98.61%

Based on end point assessments by the BCS 2022

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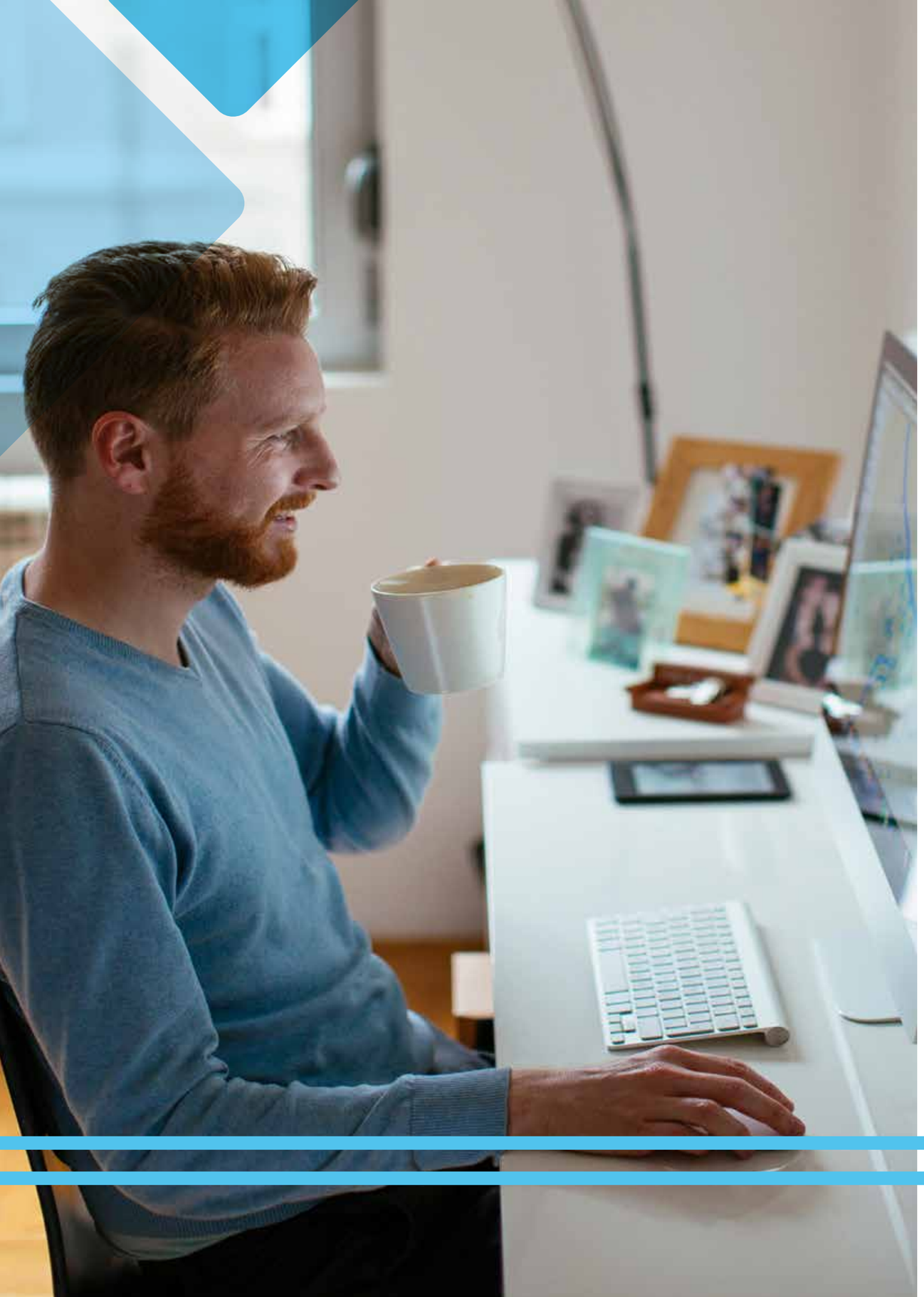


ROLE PROFILE

SOFTWARE ENGINEER

Software Engineers build and test high-quality code across front end, logic and database layers.

They will typically work as part of a larger team, in which they will interact with a number of aspects of an application; coding, design, deployment and testing.

The developer will need to be able to interpret design documentation and specifications. The customer requirements will typically be defined and agreed by more experienced or specialist members of the team, such as a business analyst or technical architect.

Software Engineers need:

- Strong maths and logical reasoning skills
- A methodical, step-by-step approach
- Attention to detail
- Business skills like effective communication, teamwork and task/time management
- The ability to troubleshoot issues where needed
- The ability to work under direction, use discretion and determine when to escalate issues

JOB ROLE SUITABILITY

As an employer is it important to assess whether a candidate (a new hire or existing employee) is working in a suitable job role to successfully complete their programme.

The checklist has been created to help you assess whether your apprentice will be in a position to demonstrate all of the following Software Engineer duties, during their programme.

Job roles this programme is a great match for:

- Web Developer
- Applications Developer
- Software Developer
- Tech talent with some entry-level software development experience
- Existing development support staff looking for a step up

Checklist

1	Will they be taking and interpreting software requirements to estimate personal time and effort required for delivery?
2	Will they be able to break all development activities needed down into logical units of work
3	Will they be given the responsibility to report progress throughout the development life cycle?
4	Will they have the responsibility to identify and report any impediments to software development activities and propose practical solutions?
5	Will they have the autonomy to convert customer requirements into both functional and non-functional technical requirements?
6	Will they have the responsibility to identify and select the most appropriate technical solution for a given problem, whilst considering coding best practise and quality standards?
7	Will they be responsible for communicating software development solutions to a range of internal or external stakeholders?
8	Will they be a part of considerations towards the security implications of a proposed application's design?
9	Will they have the opportunity to write logical and maintainable software solutions to meet coding design and standards of their organisation?
10	Will they be applying security best practise to the software solution throughout the software development life cycle?
11	Will they be creating and maintaining appropriate project documentation?
12	Will they be applying appropriate recovery techniques to ensure software solutions are not lost?
13	Will they be implementing appropriate change control for software tracking and quality?
14	Will they be carrying out unit testing for their solutions with appropriate levels of test code coverage?
15	Will they be performing testing (outside of unit testing) for a software solution?
16	Will they be required to deliver a suitably documented, deployable solution for customer use?
17	Will they be supporting the delivery of one or more software deployment phases, such as trials and final release?
18	Will they be providing support during software trials and after final release?
19	Will they be working towards and respond appropriately to given Service Level Agreements (SLAs)?
20	Will they have the opportunity to apply suitable bug fixes dependent on the severity and priority of a software development issue?
21	Will they be practicing continuous self-learning to keep up to date with technological developments?

ENTRY REQUIREMENTS

The entry requirements for this programme are as follows:

- The learner must have completed a Level 3 Software Development Apprenticeship with QA or have an equivalent qualification with another training provider, or
- An A-Level in a Science, Technology, Engineering or Mathmatics (STEM) subject and a successful completion of our Aptitude Test, or
- A BTEC Diploma in IT and a successful completion of our Aptitude Test, or
- 2 years' experience in a relevant role and successful completion of our Aptitude Test.

Accelerated Introduction to Software Development

The following introduction will exist for those learners who have not reached the minimum requirements for standard entry. To support candidates not meeting the required entry criteria they will be invited to undertake an intensive 6-week learning module combining 3 weeks in the classroom and 3 weeks of supported learning online.

The accelerated learning into programming will include:

- Developer Toolset
  - Front end – HTML, CSS3, JavaScript
  - Back end – Python, Java, SQL
- Mathematics and Computational Thinking
- Coding and Logic

FINDING NEW TALENT

Each year, QA attracts over 100,000 applicants for our early careers opportunities, building a robust pipeline of fresh tech talent.

Our success lies in leveraging a wide array of channels and partnerships that ensure we have a constant flow of applications and access to a diverse range of candidates.

We have strong partnerships in place with educational and career institutions, including local job centres, career networks, youth groups, and universities.

We have a prominent presence on all major job boards in the market, ensuring maximum visibility for our job postings.

Our QA team employs social media campaigns to reach specific profiles in certain regions or demographics.

INCLUSIVE TOP50 UK EMPLOYERS 2022/23 — 40th MOST INCLUSIVE EMPLOYER

clearassured SILVER

QA attracts over **100,000 applicants a year** for its apprenticeship and tech early careers programmes

Building **a strong pipeline of fresh tech talent** via free workshops and initiatives like Teach the Nation to Code, National Graduate Week and National Apprenticeships Week workshops

Proactively **engaging with thousands of sixth forms/colleges and universities**, attending carers fairs to ensure that we reach talent first

Maintaining a **diverse candidate pool** with **54%** of applicants indicating that they are of an ethnic minority background and **33%** identifying as female

DIVERSITY AND INCLUSION

We're passionate about diversity in tech

It's our mission to help eradicate the gender gap, and make sure equal opportunities are given to applicants from all backgrounds. We do this through our long-standing partnerships, QA-driven initiatives and use of trending tools and software.

Diversity-first candidate attraction

We've invested in using augmented copy checking tools to ensure language is inclusive, open to all and free from bias.

We use inclusive imagery throughout our campaigns – producing visual content that promotes diversity and inclusion.

Diversity partnerships

We forge partnerships with like-minded organisations who share our vision on STEM gender equality including STEM women, Stemettes, Young Professionals and Coding Black Females.

We make tech skills accessible to all

We run free tech workshops including '**Teach the Nation to Code**' and '**Teach the Nation to Cloud**' so anyone can explore technology career opportunities.

Promoting inclusivity

We nurture relationships with influencers, schools, colleges and universities via events and interactive sessions to ensure learners from all backgrounds are given the same opportunities.

Initial Assessment

Every candidate goes through an initial assessment where their current knowledge, skills and behaviours are measured and mapped against the apprenticeship standard.

This process is an assessment of the apprentice's eligibility for an apprenticeship programme, and ensures they are placed on the right programme at the right time, This contributes towards a successful completion and a good learner experience.

A BLENDED APPROACH TO LEARNING

How we deliver

QA apprenticeships are designed to immerse the apprentice in their job role while providing time for them to complete the required off-the job training to become occupationally competent and ready to undertake End-Point Assessment to complete their apprenticeship standard.

QA Apprenticeships also provide more flexibility for the employer, allowing apprentices to learn through a combination of project and lab work, live events, self-research, self-paced learning and peer-to-peer learning.

Full-time apprentices (those that work 30 hours per week or more) will be required to spend at least 20% of the apprentice's normal working hours over the planned duration of the apprenticeship practical period on off-the-job training. This means the minimum requirement for apprentices working 30 hours or more per week is an average of 6 hours of off-the-job training per week (i.e. 20% of 30 hours) over the planned duration.

Employer coaching, shadowing and mentoring remain off-the-job training, however, there will be more defined requirements to guarantee this is directly related to the apprenticeship and will be part of the training plan.

LEARNER SUPPORT

Safeguarding at QA

Safeguarding means ensuring the safety and wellbeing of our learners.

At QA, this means ensuring our polices and processes promote and protect learner wellbeing and that while you are on programme, and that while on programme, we teach learners about the types of risk facing modern day British citizens.

This includes cyber risks, mental and physical health information, risks of radicalisation or grooming and much more.

Prevent at QA

Prevent is part of the Government's counter-terrorism strategy.

At QA, this means we teach our staff and learners about the four British values: democracy, rule of law, individual liberty and respect and tolerance.

We also work with Prevent partners to identify people at risk of being or causing terror related harm.

Mental Health at QA

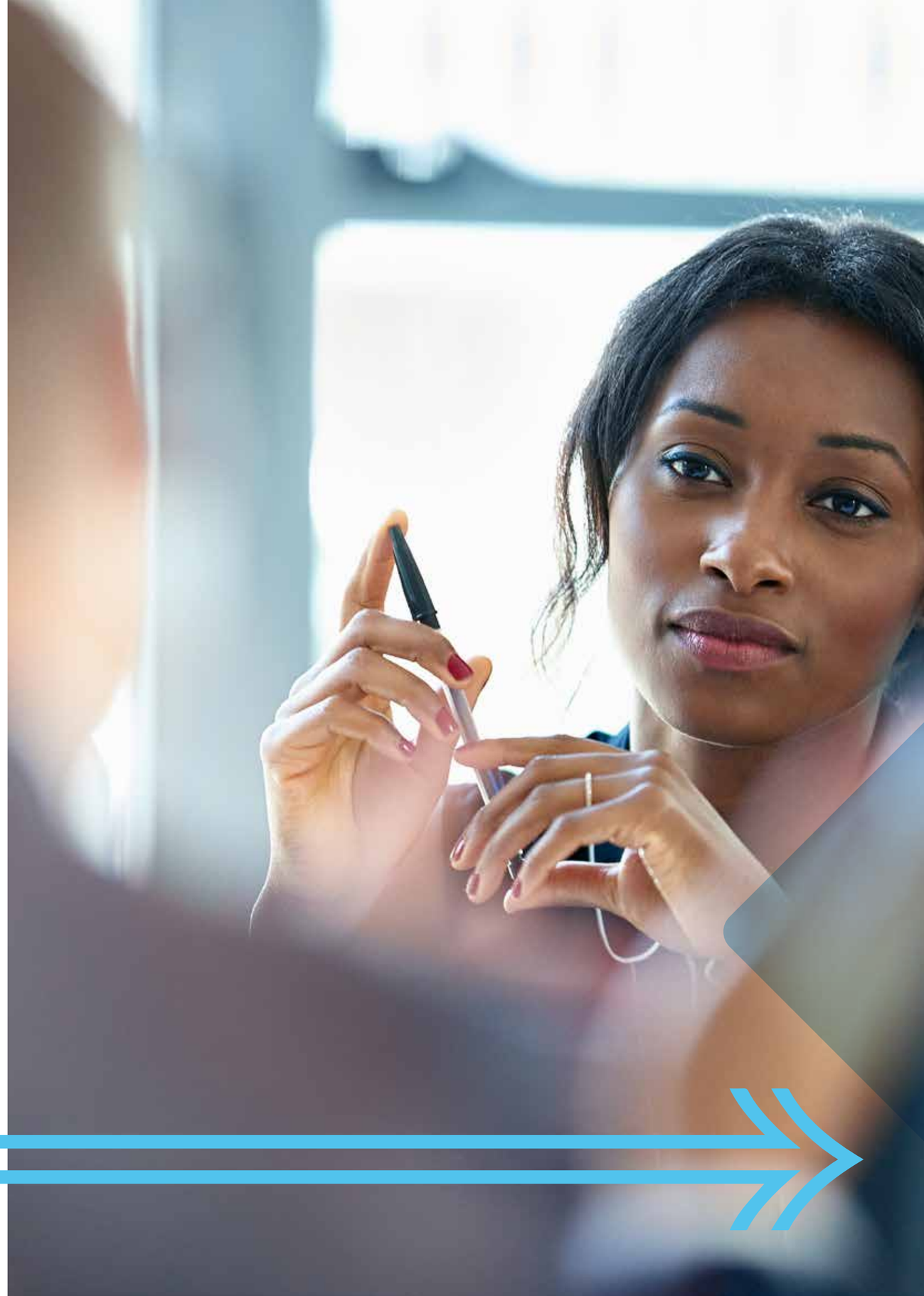
Emotional and mental wellbeing is an important component of successful learning.

Understanding how to protect mental health and promote emotional wellbeing is part of maintaining positive mental welfare.

We will always actively encourage conversations and make sure information is readily available to both learners and staff with regards to mental wellbeing.

Ways to access support if you are worried for yourself or someone else:

- Call us – anytime 07808 050273
- Email: safeguarding@qa.com
- Contact your Digital Learning Consultant (DLC), tutor or account manager
- Speak to any member of QA staff onsite



DIGITAL BY DESIGN APPRENTICESHIP PROGRAMMES

Digital by Design Programmes

QA Digital by Design apprenticeships provide a greater focus on online learning together with using live interaction where it adds the most value for learners.

It means that there is a single learner journey which brings teaching, coaching, learning and assessment into a single, repeatable flow for every module. This ensures that from the beginning of the programme there is a clear focus on successful completion of the End-Point Assessment (EPA).

In Digital by Design, these three elements will work together:

- The Content
- The Service and Support
- The Technology

Discover, practise and apply

All QA apprenticeships use a guided discovery approach to learning, as opposed to traditional methods of delivery such as live events. This shifts the emphasis from content delivery to our learners and their context, resulting in the apprentice feeling empowered to take ownership of their learning experience through the “Discover, Practise, Apply” model.

DISCOVER

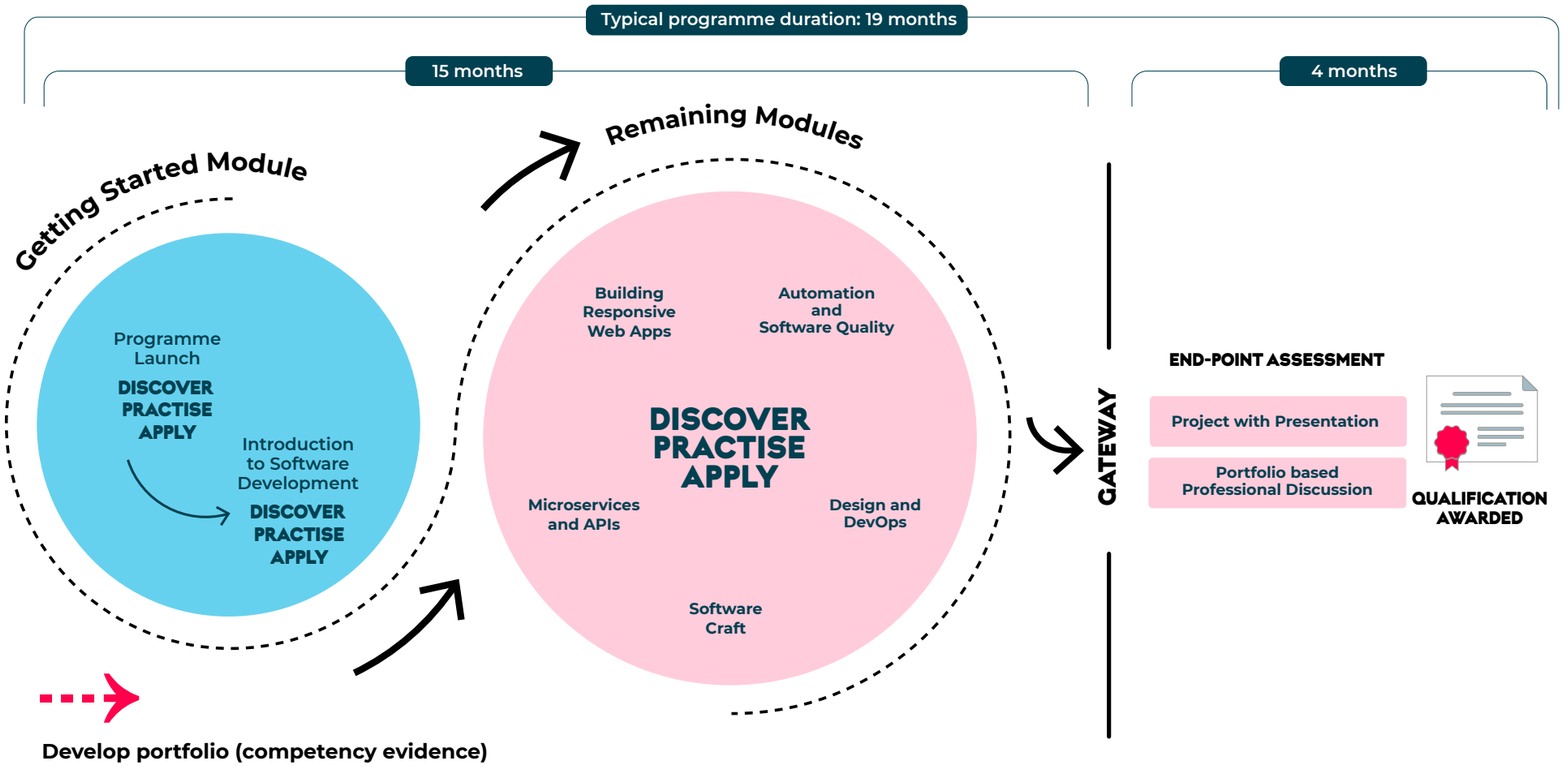
Learners will learn the theory, by exploring subjects online and in the live events.

PRACTISE

Learners will practise their new-found knowledge by completing activities - online, in the live events and (most importantly) directly at work in their day-to-day role.

APPLY

Learners will apply what they’ve discovered and practised at work. They will actively contribute to your organisation whilst building their portfolio of evidence (showing how they’ve applied their new skills) to gain their qualification.



Develop portfolio (competency evidence)

Level 2 functional skills, English and Maths must be passed as part of the programme (if not already) and certificates presented, prior to taking the End-Point Assessment. This will be discussed at programme launch.

THE LEARNER'S JOURNEY

Typical Programme Duration: 15 months (+ 4 months for End-Point Assessment)

GETTING READY TO START

PROGRAMME LAUNCH

- Safeguarding Module
- H&S: Workstation Assessment
- Functional Skills: Maths and English Diagnostics
- Functional Skills: Maths and English Learning
- **Check-in session**

15 months learning

Module 1:
Accelerated Introduction to Software Development
(10 weeks)

- **Employer Check-in**

Module 2:
Building Responsive Web Applications
(8 weeks)

- Functional Skills: Speaking, Listening and Communicating Exam Preparation
- Functional Skills: Maths and English (RandW) Mock Exams
- Functional Skills: Speaking, Listening and Communicating Exam
- Functional Skills: Maths Exam
- Functional Skills: English (R) Exam
- Functional Skills: English (W) Exam

Module 3:
Automation & Software Quality
(8 weeks)

- **Employer Reflection (1 of 2)**

Module 4:
Design & DevOps
(8 weeks)

Module 5:
Software Craft
(8 weeks)

Module 6:
Microservices & APIs
(8 weeks)

- **Employer Reflection (2 of 2)**
- **Portfolio Consolidated**

4 months EPA

End-Point Assessment

Qualification Awarded

GETTING STARTED MODULE

The modules in our Software Engineer apprenticeship equip learners with the advanced technical skills they need for their role. Each module develops the core set of skills they must be able to do well to be competent.

In each module, learners will ‘discover’, ‘practise’ and ‘apply’ what they’ve learned. This helps them put their newly-found knowledge into action back at work.

There are 6 modules to complete with the following learning outcomes.

Module 1: Accelerated Introduction to Software Development

Programme Launch
(Synchronous Session Online)

This hour-long online session introduces learners to the programme and will cover the following items:

- Programme outline and structure
- Software development activity
- Assessments, certification and qualifications included
- Typical workflow
- Time commitment
- Calendar planning for the apprenticeship
- Setting of expectations
- Introduction of Bud, and other technology requirements

At the end of this session, learners will be ready to progress with their learning online.

Module duration: 10 weeks
Classroom attendance: 12 days

Discover. Practise. Apply.

This module is a 10 week “blended boot camp” to give learners the skills and experience needed to be successful and to hit the ground running. Learners will take a Technical Test to determine their starting point. In some cases learners will be able to skip this module.

The content will focus on the fundamental skills all software developers need, this includes:

- Algorithms, logic and data structures
- Front end development with HTML, CSS and JavaScript
- Back end development with Python and SQL
- Object-oriented programming principles
- Software patterns
- Secure development practises
- Mathematics and computational thinking
- Agile fundamentals

The knowledge gained will allow learners to apply these skills in the workplace to build evidence for their summative portfolio.

REMAINING MODULES

The remaining modules focus on the knowledge and skills required of a Software Engineer in detail. After each module learners will 'apply' what they've learned at work on current projects.

Module 2:
Building Responsive Web Applications

This module will develop more advanced applications using HTML5, CSS3 and JavaScript. This includes:

- Responsive development practises with HTML5 and CSS3
- JavaScript framework; Node.js, ReactJS and AngularJS
- User Interface development
- Coding and Logic

After this module, learners will put their new-found knowledge into action at work, progressing their learning online.

Module duration: 8 weeks
Classroom attendance: 3 days

Module 3:
Automation and Software Quality

Learners will gain an understanding behind the theory of testing, alongside manual and automated testing through Selenium.

- Plans, designs and conduct tests
- Reviewing requirements and specifications and define test conditions.
- Analyses test requirements, designs and building test case suites.
- Interprets and executes moderately complex test scripts
- Check test results and documents failures.
- Analyses and reports test results
- Reviews and tests non-functional aspects of systems.

After this module, learners will put their new-found knowledge into action at work, progressing their learning online.

Module duration: 8 weeks
Classroom attendance: 2 days

Module 4:
Design and DevOps

This module introduces learners to the concept of DevOps and further knowledge of how software is designed and deployed. This includes:

- Agile and Waterfall fundamentals
- UI/UX (user interfaces/user experience)
- Introducing DevOps
- Build management and containerisation
- Application deployment

After this module, learners will put their new-found knowledge into action at work, progressing their learning online.

Module duration: 8 weeks
Classroom attendance: 3 days

Module 5:
Software Craft

This module consolidates and develops the most important and advanced skills a developer needs to take the next steps in their career. This includes:

- Version Control and CI/CD
- Software design patterns
- Pair programming
- Code coverage
- TDD and BDD

After this module, learners will put their new-found knowledge into action at work, progressing their learning online

Module duration: 8 weeks
Classroom attendance: 3 days

Module 6:
Microservices and APIs

This module focuses on the future skills that developers will need in their career. This includes:

- Microservices architecture
- RESTful APIs
- The cloud

After this module, learners will put their new-found knowledge into action at work, progressing their learning online.

Module duration: 8 weeks
Classroom attendance: 2 days

Gateway and End-Point Assessment
Consolidation, Preparation and Assessment (Online)

This final component will get learners ready to go through the 'gateway'.

The apprenticeship gateway is an internal QA process. It will ensure that your learner's work is ready to be assessed by BCS. This exists to increase their chances of success.

At this pre-gateway stage learners will:

- Consolidate and submit their portfolio
- Conduct a mock EPA

In addition to the items above, learners must have successfully completed all the Functional Skills exams (except exempt learners)

Once learners have met all the above criteria, they will go through the gateway. When approved, it takes 3 months from gateway to achievement.

During this time, learners will:

- Complete their work-based project with questioning.
- Complete their professional discussion underpinned by portfolio.

Duration: 7 days + EPA

Qualifications Earned

When they achieve this apprenticeship, learners will earn the following qualifications:

- Software Developer Level 4 Apprenticeship

LEARNING OUTCOMES

Apprentices will be assessed on 3 key areas; their ability to convey knowledge, their ability to demonstrate practical skills and their capability of displaying professional workplace behaviour. These will be developed during an apprentice's learning journey, with the goal of displaying all of these competencies during their assessment.

These knowledge, skills and behaviour points ensure rounded development, as the standards provide a greater emphasis on the importance of both technical and soft skills in the workplace.

KNOWLEDGE

- K1: all stages of the software development life cycle (what each stage contains, including the inputs and outputs)
- K2: roles and responsibilities within the software development lifecycle (who is responsible for what)
- K3: the roles and responsibilities of the project life cycle within your organisation, and your role
- K4: how best to communicate using the different communication methods and how to adapt appropriately to different audiences
- K5: the similarities and differences between different software development methodologies, such as agile and waterfall.
- K6: how teams work effectively to produce software and how to contribute appropriately
- K7: software design approaches and patterns, to identify reusable solutions to commonly occurring problems
- K8: organisational policies and procedures relating to the tasks being undertaken, and when to follow them. For example, the storage and treatment of GDPR sensitive data.
- K9: principles of algorithms, logic and data structures relevant to software development for example:
  - Arrays
  - Stacks
  - Queues
  - Linked Lists
  - Trees
  - Graphs
  - Hash Tables
  - Sorting Algorithms
  - Searching Algorithms
  - Critical sections and race conditions.
- K10: principles and uses of relational and non-relational databases
- K11: software designs and functional/technical specifications
- K12: software testing frameworks and methodologies

SKILLS

- S1: create logical and maintainable codes
- S2: develop effective user interfaces
- S3: link code to data sets
- S4: test code and analyse results to correct errors found using unit testing
- S5: conduct a range of test types, such as Integration, System, User Acceptance, Non-Functional, Performance and Security testing.
- S6: identify and create test scenarios
- S7: apply structured techniques to problem solving, can debug code and can understand the structure of programmes to identify and resolve issues
- S8: create simple software designs to effectively communicate understanding of the program
- S9: create analysis artefacts, such as use cases and/or user stories
- S10: build, manage and deploy code into the relevant environment
- S11: apply an appropriate software development approach according to the relevant paradigm (for example object oriented, event driven or procedural)
- S12: follow software designs and functional/technical specifications
- S13: follow testing frameworks and methodologies
- S14: follow company, team or client approaches to continuous integration, version and source control
- S15: communicate software solutions and ideas to technical and non-technical stakeholders
- S16: apply algorithms, logic and data structures
- S17: interpret and implement a given design whist remaining compliant with security and maintainability requirements

BEHAVIOURS

- B1: Works independently and takes responsibility. For example, has a disciplined and responsible approach to risk, and stays motivated and committed when facing challenges
- B2: Applies logical thinking. For example, uses clear and valid reasoning when making decisions related to undertaking work instructions
- B3: Maintains a productive, professional and secure working environment
- B4: Works collaboratively with a wide range of people in different roles, internally and externally, with a positive attitude to inclusion & diversity
- B5: Acts with integrity with respect to ethical, legal and regulatory ensuring the protection of personal data, safety and security.
- B6: Shows initiative for solving problems within their own remit, being resourceful when faced with a problem to solve.
- B7: Communicates effectively in a variety of situations to both a technical and non-technical audience.
- B8: Shows curiosity to the business context in which the solution will be used, displaying an inquisitive approach to solving the problem. This includes the curiosity to explore new opportunities, and techniques; the tenacity to improve methods and maximise performance of the solution; and creativity in their approach to solutions.
- B9: Demonstrates creativity and tenacity in their approach to solutions and the methods used to come to a solution for example, sees the task through to the end by devising new solutions and despite obstacles and problems along the way.
- B10: Committed to continued professional development.

HOW TO GET READY FOR THE END-POINT ASSESSMENT

We want to deliver memorable learning experiences, whilst developing learners with well-rounded skillsets, ready to meet their professional requirements.

To ensure we are achieving this goal consistently, it is important for learners, digital learning consultants and employers to work together to ensure learners are supported to succeed in their apprenticeship's End-Point Assessment (EPA).

In this section we outline a number of guidelines which intend to provide a framework so that this can be achieved in a consistent way.

Preparation for the end-point assessment starts from day one.

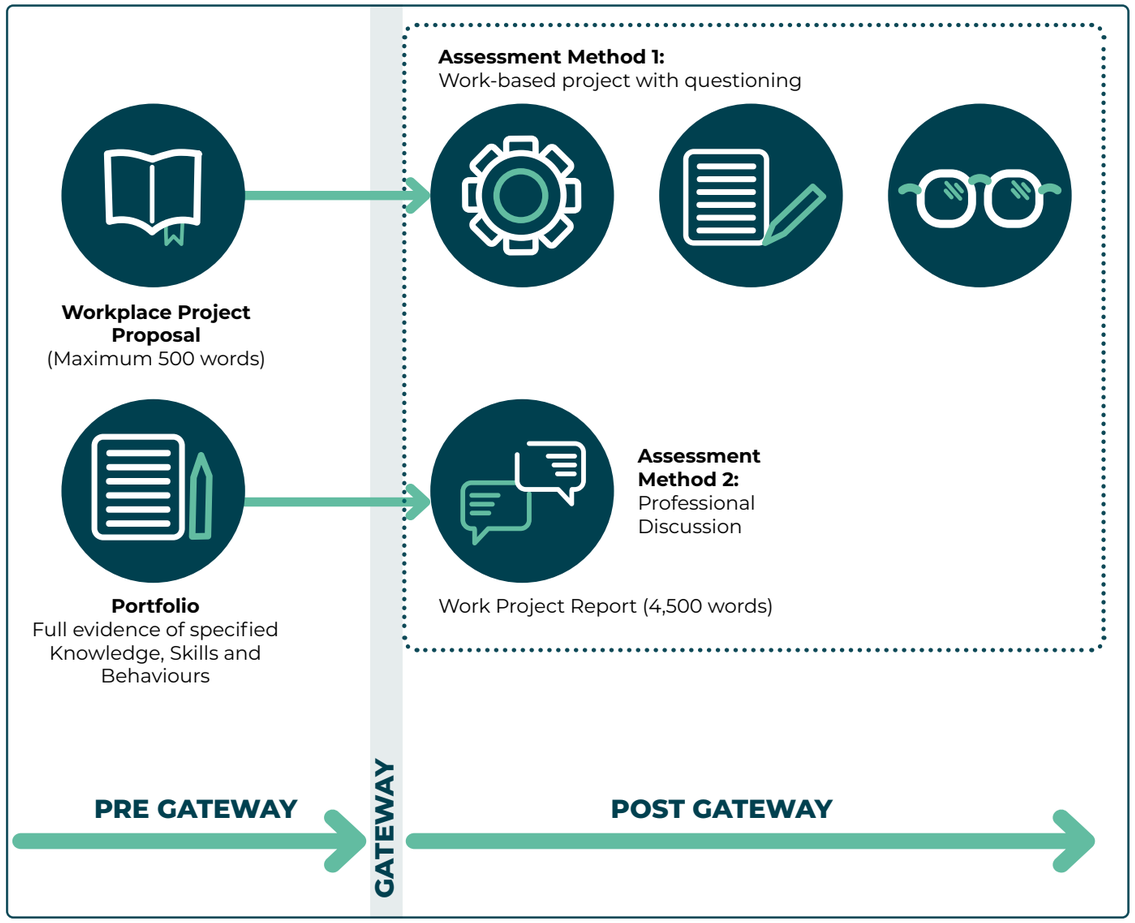
STAYING ON-TRACK THROUGHOUT THE PROGRAMME

Learners and employers should start preparing for EPA from the start of the programmme. Employers will need to ensure that learners are given the right opportunities at work to develop and prove the knowledge, skills and behaviours in the standard.

For this reason, it is very important to keep learners, digital learning consultants and employers informed about the programme progress. It is critical to the success of the apprenticeship programme that all of the above work together to ensure that each learning journey is kept on-track avoiding further interventions (and time commitment) whenever possible.

To help learners with this, we have created two guiding documents – a programme timeline, and a progress review map – so progress can be checked against it, at any time. Any progress deviations above 15% will be reviewed on a case-by-case basis. This is to ensure the apprenticeship is progressing in a timely manner.

HOW THE EPA IS GRADED



EXPANDING TECHNICAL SKILLS THROUGH CLOUD ACADEMY

Our apprentices are given full access to our proprietary Cloud Academy platform for the duration of their programme.

Cloud Academy brings the very latest and up-to-date content to our apprentices through single units, courses and comprehensive learning paths to really build on the core learning outcomes defined within the programme. Furthermore, apprentices are able to prepare for the full suite of vendor qualifications across AWS, GCP and Azure and much more.

Cloud Academy users also benefit from Hands-On Labs, Lab Challenges and Lab Playgrounds providing a safe, sandbox environment in which our learners are able to practise in real time through guided walkthroughs or through their own exploration.

Check out the Training Library - Cloud Academy.

FOR MORE INFORMATION, PLEASE CONTACT

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qa.com/contact

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