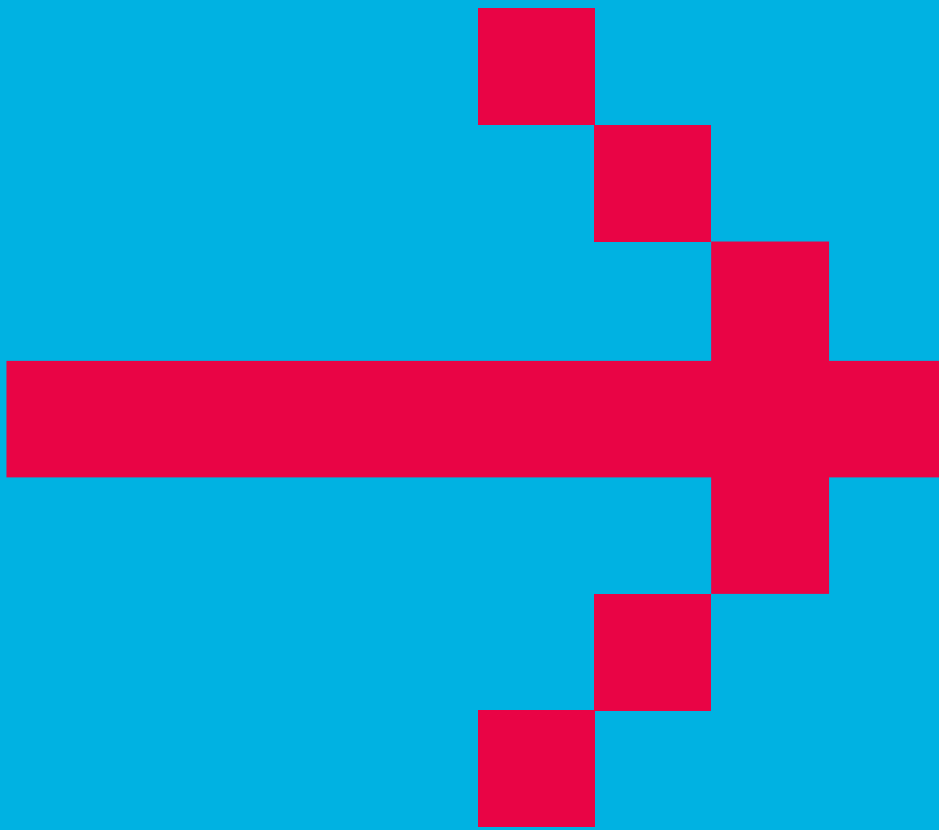




**Software Developer
Apprenticeship
Level 4**

**A Digital by Design
programme**



PROGRAMME GUIDE



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What does “Digital by Design” mean?

It means a greater focus on online learning together with using face-to-face 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.

It means that there is a clear focus from the beginning of the programme 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

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ROLE PROFILE

Software Developer

Software Developers build and test high-quality code across front end, logic and database layers. They will typically be working as part of a larger team, in which they will have responsibility for some of the straightforward elements of the overall project.

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 Developers 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

To help you determine whether a candidate (a new hire or existing employee) will be working in a suitable job role to successfully complete this programme, you must be able to answer “yes” to the following questions.

Will they be doing a full time technical role revolving around coding and programming?

Will they be responsible for testing code?

Will they be responsible for software development projects and tasks?

Will they be involved with user interface design?

Will they be actively writing code in at least one programming language?

Have they already been through a junior development role, or had some prior experience in software development?

Will they be involved with working with databases and connecting to databases?

Will they be involved with deployment of code into enterprise environments?

Will they be creating data models and designing software?



Speak to your Account Manager for more advice on eligibility and job role/existing staff suitability for this programme.

QUALIFICATIONS EARNED

By completing the Software Developer Level 4 apprenticeship, learners will earn the following qualifications:

Software Developer Level 4 Apprenticeship

BCS Diploma in Software Development Methodologies

**Microsoft Technology Associate (MTA):
HTML5 Application Development Fundamentals**

Evidencing 20% off-the-job learning

This 20% off-the-job learning is an apprenticeship requirement. It must be completed in working hours.

Our programme facilitates off-the-job learning.

We blend online learning, on-the-job learning, and classroom training in a seamless way.

We are the apprenticeship experts and can advise you on this topic.



DISCOVER, PRACTICE AND APPLY

Discover, practice and apply are the three pillars of apprenticeship learning.

No matter what part of the apprenticeship a learner is on, discover, practice and apply are combined into each activity.

Discover

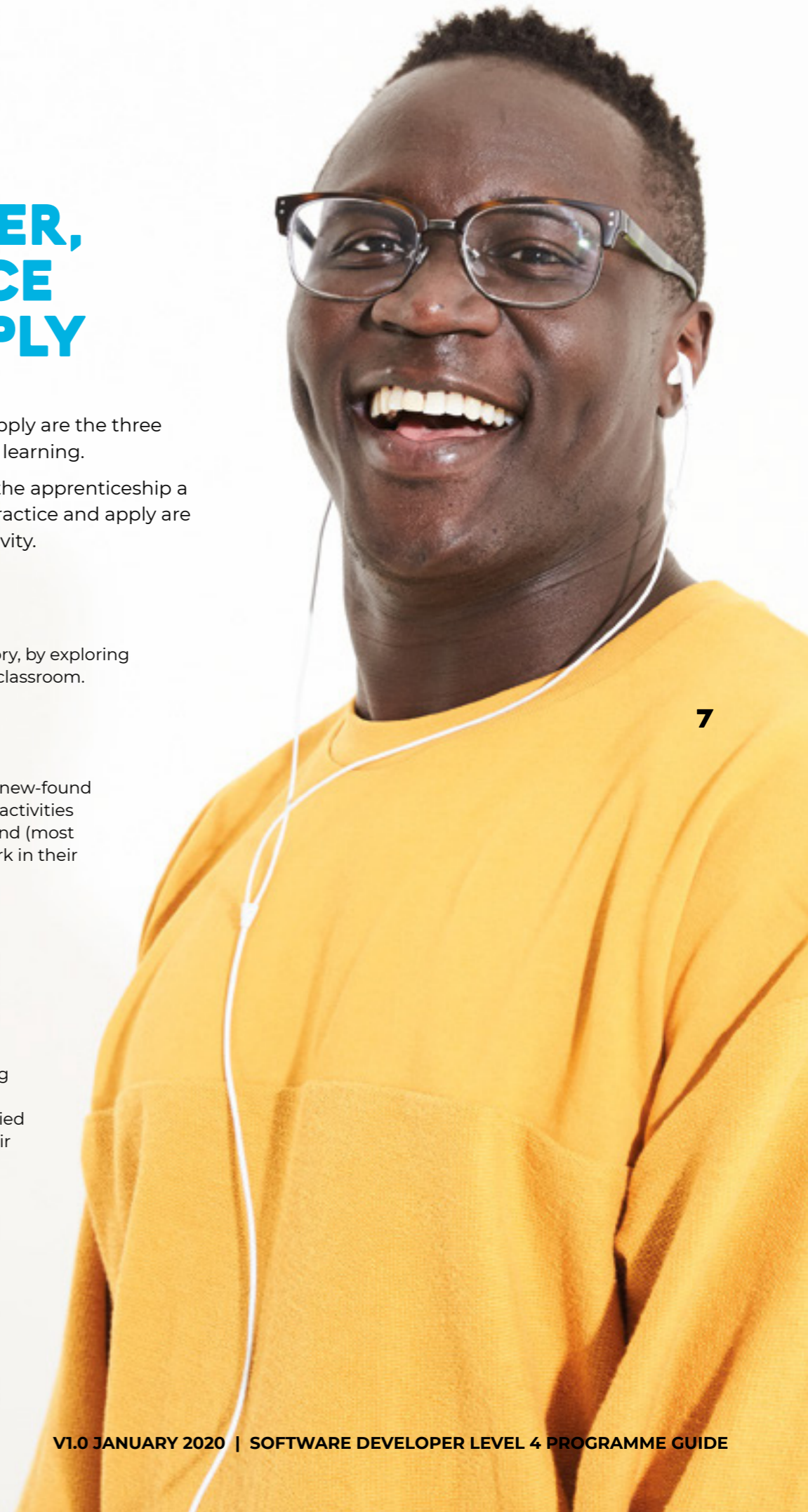
Learners will learn the theory, by exploring subjects online and in the classroom.

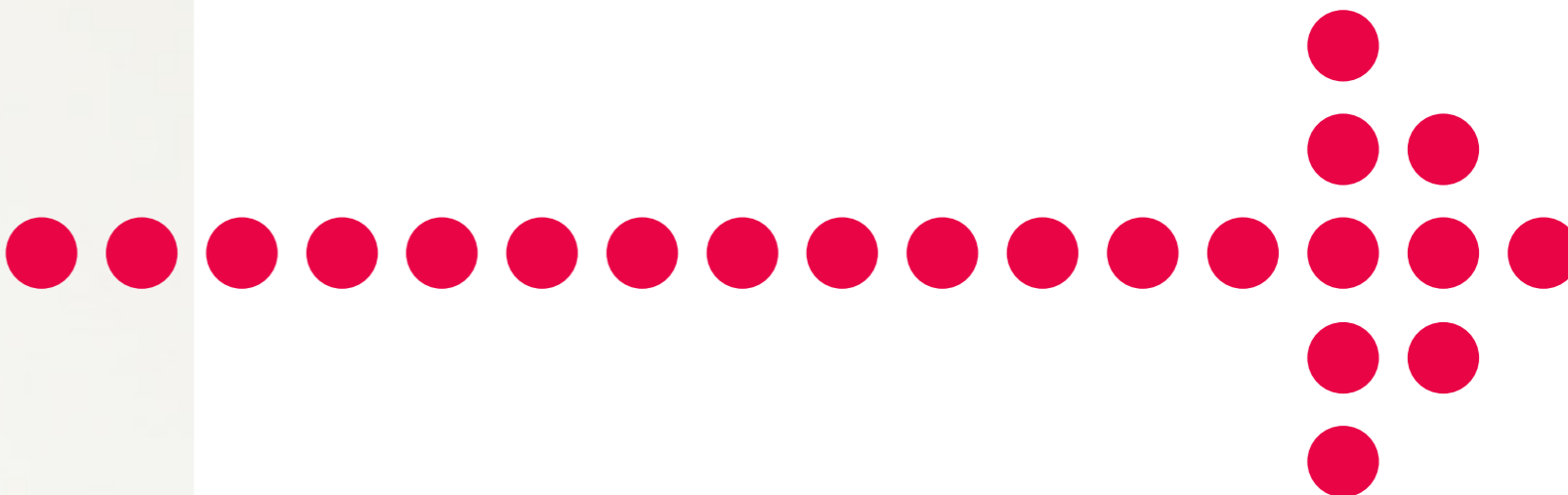
Practice

Learners will practise their new-found knowledge by completing activities - online, in the classroom 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.





INTRODUCING... DIGITAL LEARNING CONSULTANTS

In the new world of apprenticeships, learners will be taken through their programme by a team of people called Digital Learning Consultants, or DLCs for short (they're subject matter experts).

On-programme support:

- **3, 2, 1...launch!** The structured programme launch is tailored to the learner and focussed on learning engagement and setting expectations.
- **More help for learners.** Any Digital Learning Consultant can support any learner - so no waiting around for a specific person to be available (this is called a many-to-many approach).
- **Digital first.** Using digital, you're connected to help. Face-to-face visits are only arranged when specific help is required.
- **Faster.** We provide feedback on submissions within 24 hours.
- **Group sessions.** There are still regular, planned group guidance sessions to get the benefit of working with others.
- **EPA Readiness.** We check-in regularly, with planned EPA readiness checks that demonstrate distance travelled through the apprenticeship and highlight areas for development.
- **Data driven.** We proactively monitor data to identify learners at risk of falling behind. We take action to re-engage them with their apprenticeship to make sure they stay on track to achieve and remain on the programme.
- **Right learner, right role, right time.** We have developed a 5-week initial support plan to make sure the right learner is in the right role at the right time. This is essential to success.

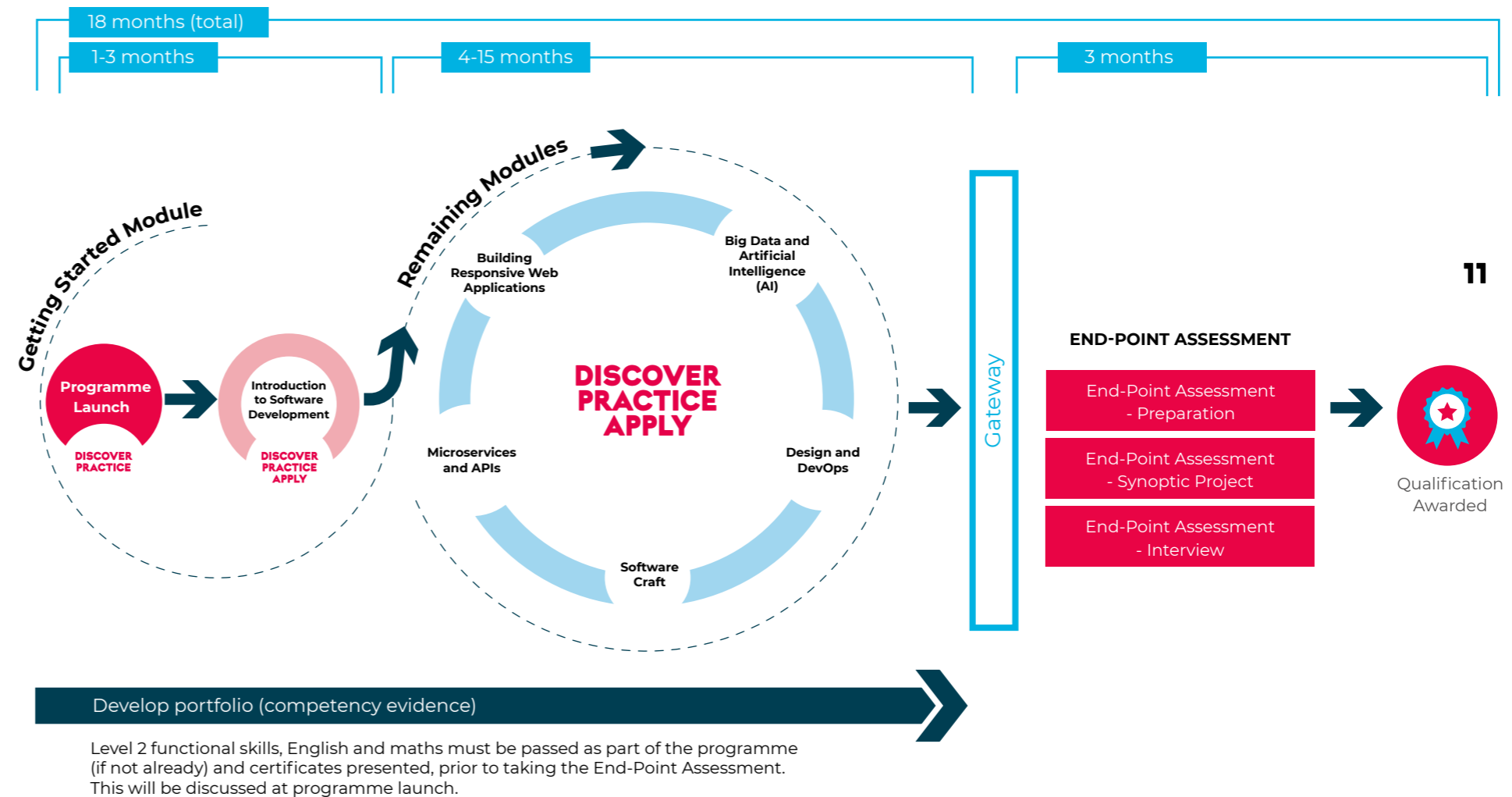


THE APPRENTICESHIP PROGRAMME

Software Developer Level 4

This apprenticeship is typically 18 months long. The minimum duration of the practical period is 15 months, and then 3 months for EPA. Some learners may finish their programme in less time if their EPA is completed quickly.

This flowchart shows how learners progress throughout the apprenticeship and how the whole programme uses our blended approach to learning.



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GETTING STARTED

After enrolling in the programme, learners will attend an online session. This will give them an overview of the programme and a practical introduction to coding and logic. Learners will then start their first module, Introduction to Software Development.

REMAINING MODULES MONTHS 4-15

Learners work through 6 modules, which include online learning material on a virtual learning environment, classroom sessions, and applying the learning hands-on in their job.

Learners will also build their portfolio and have regular check-ins with a Digital Learning Consultant (DLC) and their line manager.

GATEWAY 3 MONTHS BEFORE LEARNER'S TARGET END DATE

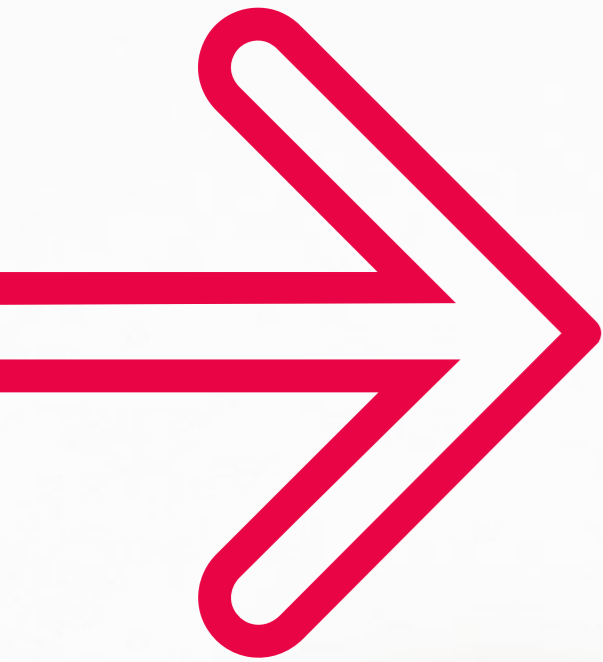
Learners will go through the 'gateway' stage when they have:

- > Completed all knowledge modules
- > Passed all mandatory exams
- > Passed all Functional skills exams, or when exemptions have been confirmed
- > Completed both their summative portfolio, and final employer reference

EPA MONTHS 15-18

Learners complete their End-Point Assessment (including the synoptic project and interview).

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GETTING STARTED MODULES

The modules in our Software Developer 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', 'practice' 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: Introduction to Software Development

Module duration: 10 weeks | **Classroom attendance:** 15 days

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.

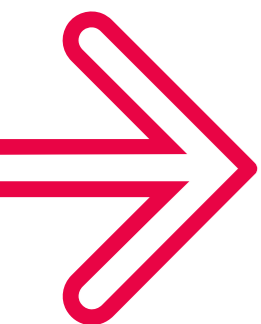
Discover. Practice. Apply.

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 practices
- 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 Developer in detail. After each module learners will 'apply' what they've learned at work on current projects.

Module 2:

Building Responsive Web Applications

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

- Responsive development practices with HTML5 and CSS3
- JavaScript framework; Node.js, ReactJS and AngularJS
- User Interface development
- Fundamentals of human-computer interactions

Learners will also attempt the MTA: HTML5 Application Development Fundamentals exam.

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:

Big Data and Artificial Intelligence

Learners will build on their prior knowledge of Python to further develop their understanding of data, databases and the mathematics of Artificial Intelligence. This includes:

- Big Data and NoSQL Databases
- U-SQL for Big Data
- Algorithms and Data Structures for AI
- Advanced Python development
- Data modelling and design

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:

- DevOps fundamentals
- Agile and Waterfall development principles
- User Experience (UX)
- User Interfaces (UI)
- The Software Development Lifecycle
- Team roles and responsibilities

Learners will also attempt the BCS Diploma in Software Development Methodologies exam.

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

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

- Software patterns
- Test Driven Development
- Refactoring
- CI/CD and source control
- Coding standards and best practice
- Software testing
- Deploying code into enterprise environments

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
- Consolidate and submit their final employer reference
- Conduct a mock EPA

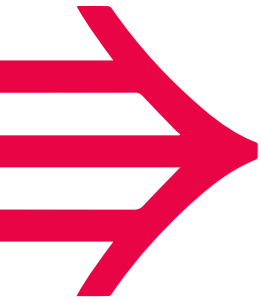
In addition to the items above, learners must have successfully completed:

- BCS exam
- MTA exam
- All the Functional Skills exams (except exempted 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 synoptic project
- Complete their interview

Duration: 7 days + EPA



LEARNING OUTCOMES

As well as being assessed on their technical knowledge, apprentices are also assessed on their ability to demonstrate the following competencies through their portfolio and interview. This ensures rounded development – as the competency standards provide a greater emphasis on the importance of both technical and soft skills in the workplace.

Technical Competencies, Knowledge and Understanding

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LOGIC

Write good quality code with sound syntax in at least one language.
Apply good practice approaches according to the relevant paradigm (for example object oriented, event driven or procedural).
Understand and apply the maths required to be a software developer (e.g. algorithms, logic and data structures).

PROBLEM SOLVING

Apply structured techniques to problem solving.
Debug code and understand the structure of programmes in order to identify and resolve issues.

BUSINESS SKILLS

Respond to the business environment and business issues related to software development.
Operate effectively in their own business's, their customers' and the industry's environments.
Understand how teams work effectively to produce software and contribute appropriately.

DESIGN

Create simple data models and software designs following best practices and standards.
Understand the similarities and differences (taking into account positives and negatives of both approaches) between agile and waterfall software development methodologies.
Understand and apply software design approaches and patterns. Interpret and implement a given design, compliant with security and maintainability requirements.
Can interpret and follow:

- Software designs and functional/technical specifications.
- Company defined 'coding standards' or industry good practice for coding.
- Testing frameworks and methodologies.
- Company, team or client approaches to continuous integration, version and source control.

SKILLS AND BEHAVIOURS

Apprentices will also need to show they have demonstrated the following skills and behaviours in their role:

- Logical and creative thinking skills.
- Analytical and problem solving skills.
- Able to work independently and to take responsibility.
- Use own initiative.
- Take a thorough and organised approach.
- Able to work with a range of internal and external people.
- Able to communicate effectively in a variety of situations.
- Maintain a productive, professional and secure working environment.

USER INTERFACE

Develop effective user interfaces for at least one channel.

TEST

Test code and analyse results to correct errors.

DEVELOPMENT LIFECYCLE

Operate at all stages of the software development lifecycle, with increasing breadth and depth over time with initial focus on build and test.

DATA

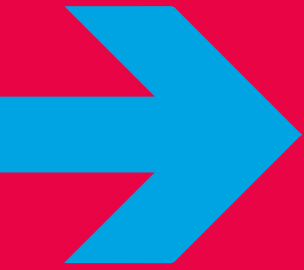
Effectively link code to the database/data sets.

ANALYSIS

Understand and create basic analysis artefacts.

DEPLOYMENT

Understand and utilise skills to build, manage and deploy code into enterprise environments.



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, skills coaches and employers to work together to ensure learners are supported to succeed in their Apprenticeship's third-party End Point Assessment (EPA).

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

Preparation for the end point assessment starts from day one.

STAYING ON-TRACK THROUGHOUT THE PROGRAMME

The EPA preparation starts as soon as each new learner joins a programme, as all its components will support the learner to develop the necessary technical knowledge, skills, and behaviours to confidently meet, or exceed, all the requirements specified in the standard.

For this reason, it is very important to keep learners, skills coaches and employers informed about the expected programme progress plan. 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 20% 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

After the EPA interview, the assessor will make a holistic judgement of the apprentice's performance across all four assessment methods based on three criteria:

1

WHAT

What has been learned

2

HOW

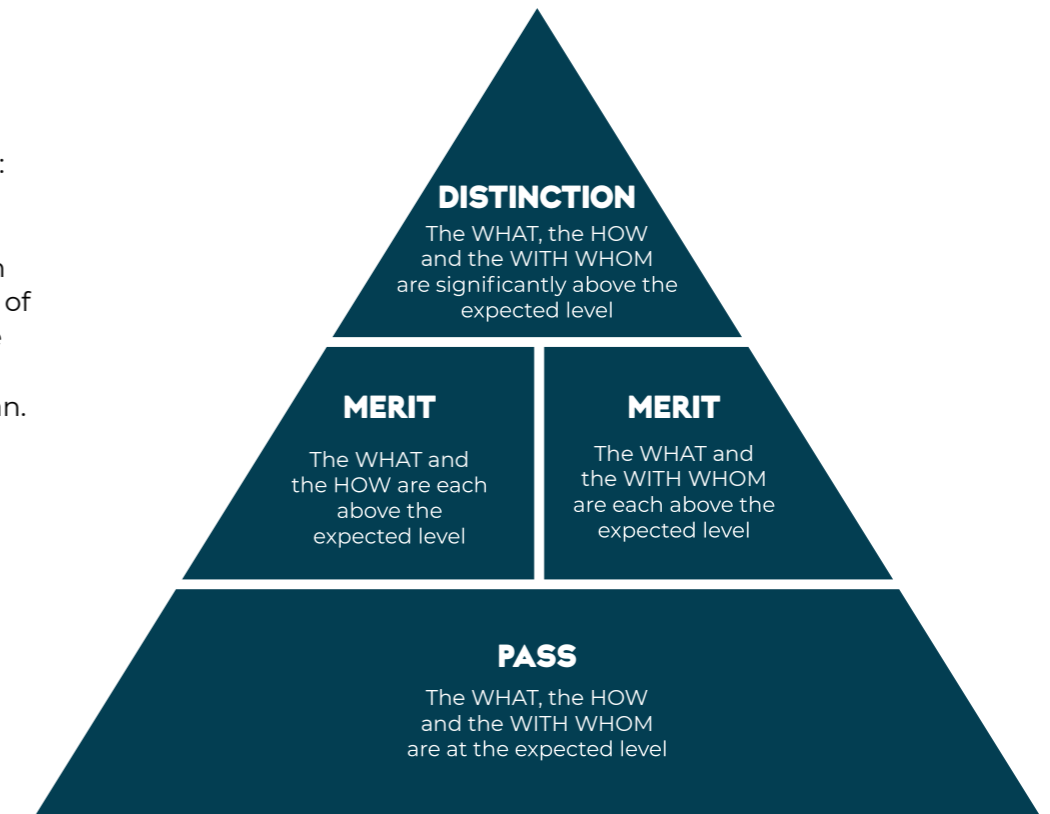
The way the work was done

3

WITH WHOM

The personal and interpersonal qualities brought to working relationships

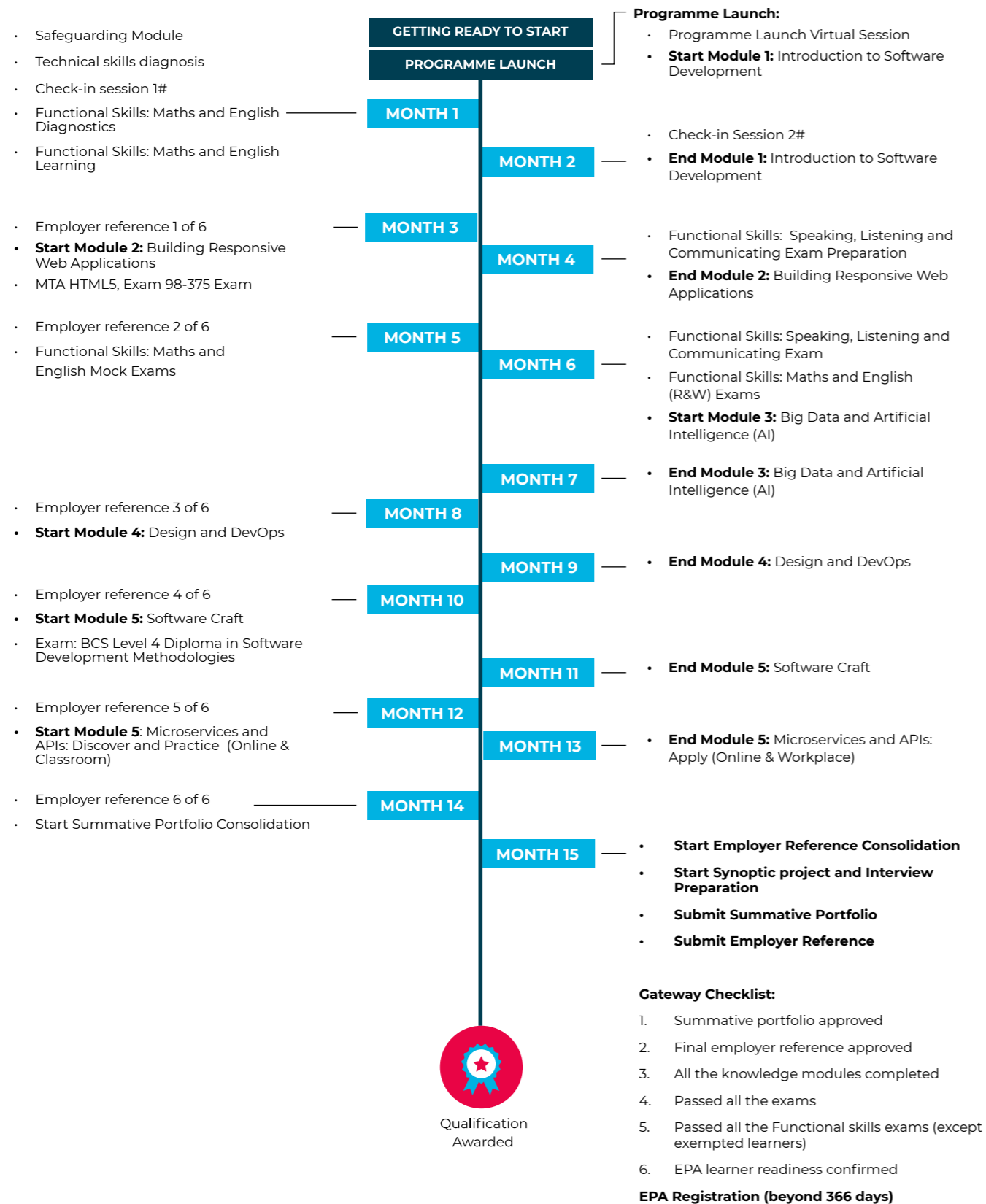
The learner will receive a single grade for their entire apprenticeship: **Pass, Merit or Distinction.** For an in-depth understanding of grading, please refer to the assessment plan.



THE LEARNER'S JOURNEY

Software Developer L4

Programme timeline | Duration: 18 Months | Gateway: 15 Months



THE LEARNER'S JOURNEY

Software Developer L4

Progress review map | Duration: 18 Months | Gateway: 15 Months



This diagram gives an estimate of what progress looks like in this learning journey. It covers specific time frames for illustration purposes only.

Each learner will see their progress percentage update live, as they complete activities in Bud.

MONTH 3

| Completion by month 3 | Completion % |
|---|--------------|
| Activity 1.1: Programme overview and practical introduction to coding and logic: Discover and Practice (Online) | Completed |
| SG1: Safeguarding Module | Completed |
| Activity 1.2: Technical diagnosis | Completed |
| Activity 1.3 (diagnostic dependent): Introduction to Software Development: Discover & Practice (Online & Classroom) | 25% |
| FS1: Functional Skills: Maths and English Diagnostics | Completed |

By the end of month 3:
A learner should have completed **25%** of their programme



MONTH 6

| Completion by month 6* | Completion % |
|--|--------------|
| Activity 1.4: Introduction to Software Development: Apply & Prove (Online & Workplace) | 5% |
| Activity 1.5: Employer reference 1 of 6 | Completed |
| FS2: Functional Skills: Maths and English Learning | Completed |
| Activity 2.1: Building Responsive Web Applications: Discover & Practice (Online & Classroom) | 7.5% |
| FS3: Functional Skills: Speaking, Listening and Communicating Exam Preparation | Completed |
| Activity 2.2: Building Responsive Web Applications: Apply & Prove (Online & Workplace) | 5% |
| Activity 2.3: Employer reference 2 of 6 | Completed |
| Activity 2.4: MTA HTML5, Exam 98-375 - Exam Pass | Completed |

By the end of month 6:
A learner should have completed **43%** of their programme



*Note: by the end of month 6 all the Functional Skills components will be completed.



Is the learner on track?

QA will be monitoring each learner's progress on an on-going basis.

At any point, they will be in one of three categories:

- **Green:** on track, or 0-5% behind target progress.
- **Amber:** 6-14% behind target progress.
- **Red:** 15% or more behind target progress.

Whenever deemed required, QA will put in place proactive measures to get learners back on track.



How is the learner performing?

QA will continuously track the quality of each learner's work, and discuss performance:

- At every **activity submission**. The work submitted will be reviewed and discussed with the learner. This will happen in the messaging system, inside each activity.
- At **EPA readiness checks**. The first of these checks will happen on the week following programme launch. After that, at every 16 weeks. This will take place in the form of a scheduled call.

Either way, our feedback will let the learner know how they are performing. We may ask learners to refine their work, or complete extra tasks, before approving it. These interactions will use Bud virtual learning environment, where they will be recorded.

54% PROGRESS

MONTH 9

| Completion by month 9 | Completion % |
|---|--------------|
| FS4: Functional Skills: Maths and English Mock Exams | Completed |
| FS5: Functional Skills: Speaking, Listening and Communicating Exam | Completed |
| FS6: Functional Skills: Maths and English (R&W) Exams | Completed |
| Activity 3.1: Big Data and Artificial Intelligence (AI): Discover and Practice (Online & Classroom) | 6.25% |
| Activity 3.2: Big Data and Artificial Intelligence (AI): Apply (Online & Workplace) | 5% |
| Activity 3.3: Employer reference 3 of 6 | Completed |

By the end of month 9:

A learner should have completed **54%** of their programme



74% PROGRESS

MONTH 12

| Completion by month 12 | Completion % |
|---|--------------|
| Activity 4.1: Design and DevOps: Discover and Practice (Online & Classroom) | 7.5% |
| Activity 4.2: Design and DevOps: Apply (Online & Workplace) | 5% |
| Activity 4.3: Employer reference 4 of 6 | Completed |
| Activity 4.4: BCS Level 4 Diploma in Software Development Methodologies - Exam Pass | Completed |
| Activity 5.1: Software Craft: Discover & Practice (Online & Classroom) | 7.5% |

By the end of month 12:

A learner should have completed **74%** of their programme



100% PROGRESS

MONTH 15

| Completion by month 15 | Completion % |
|--|--------------|
| Activity 5.2: Software Craft: Apply (Online & Workplace) | 5% |
| Activity 5.3: Employer reference 5 of 6 | Completed |
| Activity 6.1: Microservices and APIs: Discover and Practice (Online & Classroom) | 6.25% |
| Activity 6.2: Microservices and APIs: Apply (Online & Workplace) | 5% |
| Activity 6.3: Employer reference 6 of 6 | Completed |

By the end of month 15:

A learner should have completed **100%** of their programme



EPA (END-POINT ASSESSMENT)

Qualification Awarded



MONTH 16

| Completion by the end of month 16 | Completion % |
|-----------------------------------|--------------|
| Synoptic project submitted to BCS | Completed |
| Initiate interview preparation | Completed |

By the end of month 16:

| | | |
|---|-----|--------------------------------------|
| Has the learner completed the synoptic project? | YES | ● |
| | NO | ● |

QA Apprenticeships does not formally grade the apprenticeship, this is the responsibility of the End-Point Assessment organisation.

MONTH 17

| Completion by the end of month 17 | Completion % |
|-----------------------------------|--------------|
| Interview | Completed |

MONTH 18

| Completion by the end of month 18 | Completion % |
|-----------------------------------|--------------|
| Result from BCS | Completed |



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