

Level 7 Game Programmer

Innovate Awarding Assessment Specification





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Innovate Awarding

Meet our Managing Director

Welcome to the Level 7 Game Programmer Apprenticeship. Our Innovate Awarding EPA Journeys are designed to ensure the employer, provider, assessor and apprentice have the appropriate support and guidance to allow successful completion of an apprenticeship, providing further confidence and assurance having chosen us as an End-Point Assessment Organisation.

We are an Ofqual approved End-Point Assessment Organisation (EPAO), experienced in operating within a regulated market. Driven by the employers we work in partnership with, we deliver End-Point Assessment (EPA) in the Health, Care, Education, Leadership, Management, Leisure, Customer Service, Creative, Hospitality, Retail, Transport and Logistics sectors.

Delivering an apprenticeship is an extremely rewarding role. We recognise the need for a clear specification, resources and support, so more valuable time can be spent delivering to an apprentice.

At Innovate Awarding we stand by our 'no surprises' approach to assessment, making an apprenticeship journey as simple as possible, ensuring the best chance of success for every apprentice who undertakes EPA with us.

Charlotte Bosworth



About Innovate Awarding

We are an EPAO approved by the Education and Skills Funding Agency (ESFA) with a collaborative approach to doing business. We work with providers to deliver fit for purpose EPA, providing assessments for a wide range of apprenticeship standards, certificating thousands of apprentices, continuing to learn and improve with each experience.

We have experienced and responsive teams to ensure the EPA experience is smooth and efficient, working closely with our provider partners ensuring a 'no surprises' approach to EPA for all apprentices.

Please see our website for the range of Standards we are approved to deliver:

https://innovateawarding.org/end-point-assessment/apprenticeship-standards/

Innovate Awarding 2023 Assessment Specification



Our EPA Journeys

We have created four bespoke EPA Journeys tailored to the individual needs of the employer, provider, assessor and apprentice to enable a cross functional approach to EPA.

The Level 7 Game Programmer EPA Journeys are available to download on epaPRO.

EPAPro

epaPRO is our EPA platform, streamlining the process including:

- Apprenticeship registration
- Assessment scheduling to results and certification
- Policy and guidance documents
- Reporting

The platform increases efficiency and reduces administration to support every step of EPA.

epaPRO:

https://innovate.epapro.co.uk/login

The Apprenticeship Standard and Assessment Plan

An Apprenticeship Standard details the knowledge, skills and behaviours required to be occupationally competent:

- **Knowledge** the information, technical detail, and 'know-how' that someone needs to have and understand to successfully carry out the duties. Some knowledge will be occupation-specific, whereas some may be more generic.
- **Skills** the practical application of knowledge needed to successfully undertake the duties. They are learnt through on and/or off-the-job training or experience.
- **Behaviours** mindsets, attitudes or approaches needed for competence. Whilst these can be innate or instinctive, they can also be learnt. Behaviours tend to be very transferable. They may be more similar across occupations than knowledge and skills. For example, team worker, adaptable and professional.

Apprenticeships are an invaluable tool for upskilling in areas that matter most to employers. They are a highly effective route to recruit and train future talent, address skills shortages and develop careers across core parts of the business.

The Level 7 Game Programmer apprenticeship has been developed by employers working in the sector detailing the knowledge, skills and behaviours required to be occupationally competent and outlining the training and assessment journey for an apprentice.

The apprentice will typically spend 12 to 24 months on-programme, working towards the Level 7 Game Programmer Standard, combining practical training in a job with study. The extent of the on-programme time should be decided for each apprentice based on their prior learning, skills and experience. If employers are using this Standard for an existing employee, it is important to be aware that the role must represent new learning. Providers should support employers with this.

It is vital the apprentice is prepared and fully ready before they commence their EPA period, which is detailed in the Assessment Plan

The EPA period will last six months, consisting of:

- Project with software artefact/asset output and a presentation with questioning
- Professional discussion underpinned by a portfolio of evidence

Assessment Journey

On Programme Learning

The minimum on programme duration for the Level 7 Game Programmer Standard is 12 months. During this time, the apprentice (02, will develop their knowledge, skills and behaviours and compile a portfolio of evidence.

Planning Meeting

The planning meeting with the apprentice and a member of the Innovate Awarding team will take place remotely and will last around 45 minutes. The employer should also be present and dates for submissions and assessment will be agreed.

Presentation and Questioning

The apprentice's 45 minute presentation will be followed by a further 45 minutes of questions. This will most likely take place online.

Grading and Certification

The assessments will be graded as Distinction/Pass/Fail. They are weighted equally. If the apprentice achieves a pass and a distinction, they will be awarded an overall Merit grade. The last step along the journey is the receipt of the certificate which will be sent to the employer by the ESFA.

Gateway

01



To reach Gateway the employer will need to be satisfied that the apprentice is consistently working at, or above, the occupational competence of a Level 7 Game Programmer.

At Gateway the apprentice must have achieved Level 2 English and Maths.

At Gateway the apprentice will submit their portfolio of evidence for review. They will os) also submit a Project Proposal which must be approved before the apprentice begins the EPA period.

Project, Software Artefact/ **Asset and Presentation**



04 After coming through Gateway the apprentice will work on their project and produce the resulting software artefact/ asset. They will also prepare a 45 minute presentation on the outcome of the 05 project. Both will need to be submitted to Innovate before the assessment day.

Professional Discussion underpinned by a Portfolio

06 The professional discussion will take place with an Innovate Awarding Assessor and (07) will last for 90 minutes. They will ask a number of questions after reviewing the apprentice's portfolio of evidence.

The Apprentice

The Level 7 Game Programmer Standard has been designed specifically for the games and interactive entertainment industry for programmers creating software designed for entertainment and across games consoles, desktop computers, mobile devices, websites and TVs. It is suitable for AAA and indie studios.

This is a core and options apprenticeship standard, which means that apprentices must complete the Core and either the **Game Software Programmer** or **Game Technology** Programmer option.

Game Software Programmers will typically work on a specific gaming title, selecting and applying game engines and tools to realise a game design. At this Level, they are typically responsible for the development of bespoke asset pipelines, working collaboratively with other developers to maximise the value of the team's effort to the player experience.

Game Technology Programmers will work on the technologies that underpin videogames, designing and creating libraries, engines and tools which target specific hardware architectures or gaming platforms. At this level, they initiate and lead the development of standardised technologies and work collaboratively with a wide user-base to inform and improve their design and documentation.

Across both options, in their daily work, a Game Programmer will necessarily interact with a diverse, creative community of developers, providing technical authority and insight to other programmers, designers, producers, artists, animators, audio engineers, quality assurance (QA) staff and project managers. They may interact with external stakeholders, such as publishers, platform holders and external QA. They work independently and collaboratively as required, reporting to development directors, technical directors, producers, and senior staff.

At this level, Game Programmers are expected to take responsibility for leading the design and development of bespoke technical systems which affect the allocation of significant project resources. They are responsible for planning and coordinating the delivery of work for themselves and Junior Programmers and provide technical

insight and leadership to a range of creative disciplines across the larger team. They create and maintain technical standards across the organisation and its clients. This includes the technical requirements needed to submit titles to console platforms. They lead research into new technologies, identifying potential opportunities for their application. They work under limited direct supervision, responsible for the quality and accuracy of their own work and sometimes the work of others. They ensure work is completed within agreed timescales and within budgets. As their work includes communicating with external stakeholders, they must present a professional image of their employer and themselves.



Image credit: Sumo Digital

Off-the-Job Training

Off-the-job training is a statutory requirement for an English apprenticeship. It is training, which is received by the apprentice during the apprentice's normal working hours, for the purpose of achieving the knowledge, skills and behaviours of the approved apprenticeship the learner is completing.

It is an important aspect of apprenticeship training, as it gives the learner time to properly develop knowledge and skills from the programme. At the same time, it can develop a deeper understanding of the wider business, giving a learner insight into the supply chain or different departments.

Off-the-job training allows the learner to take full advantage of the programme, improving the return on investment in training costs for the employer. A developed and upskilled apprentice will lead to an increase in productivity, a clear benefit to the business.



Examples of off-the-job training include:

- Learning new skills at work through shadowing other members of the team, where this activity has been agreed and documented as part of the agreed training plan
- In-house training programmes relevant to the apprenticeship
- Coaching sessions
- Attendance at workshops, training days and webinars relevant to the apprenticeship
- Completion of online learning
- Self-study that includes reading or watching videos
- Training in new working practices or new equipment
- Role-playing or simulation exercises
- Industry visits/conferences relevant to apprenticeships
- Writing assessments, assignments and completing projects or activities
- Practical training or training in the workplace relevant to the apprenticeship

The minimum volume of off-thejob training is six hours per week, irrespective of the hours worked by the apprentice.

Gateway



Gateway is the entry point to EPA, and it is vital that all parties understand its importance. It is the point at which the apprentice has completed their learning, met the requirements of the Level 7 Game Programmer Apprenticeship Standard, and the provider and employer have reviewed the apprentice's knowledge, skills and behaviours to confirm they are satisfied that the apprentice is competent and ready to enter their EPA.

Employers are ultimately responsible for deciding when their apprentice is competent as a Game Programmer and ready to enter EPA. This decision should be taken after conversation with the provider and the apprentice. It is vital this decision is based on each individual apprentice's readiness and not because they have reached the end of the initially agreed training period.

Pre-Gateway Checks

Knowing when an apprentice is Gatewayready is much more than simply checking the apprentice has completed their learning and obtained all the mandatory requirements outlined in the Level 7 Game Programmer Assessment Plan. Although this is important, it is about the provider, the apprentice and employer being convinced that the apprentice is at the level of competence set out in the Standard and that they are prepared for EPA, so they can claim competency.

To pass through Gateway, typically the apprentice will have been training for a minimum of 12 to 24 months. They must also have:

- Achieved Level 2 English and Maths •
- Satisfied their employer that they are consistently working at, or above, the occupational competence of the Level 7 Game Programmer
- Compiled, and be ready to submit, a portfolio of 12 discrete pieces of evidence towards the professional discussion
- Completed and be ready to submit a project proposal
- A signed declaration •
- Declared any reasonable adjustments • and special considerations

Readiness for Gateway includes confirming that the apprentice's portfolio of evidence meets the requirements of

the knowledge, skills and behaviours set out within the Level 7 Game Programmer Standard. This will be confirmed at Gateway and documented on epaPRO. This notifies us that the apprentice is ready for their assessment and the EPA planning meeting will be organised.

What happens during Gateway?

During the two weeks of Gateway, we will agree the project's subject, title and scope, ensuring there is sufficient scope to meet the KSBs mapped to Assessment Method 1, enabling the apprentice to stand the best chance of achievement.

The Project Proposal must scope out the work-based project and should include a summary of the stages to be covered by the work-based project and an overview of the tasks as well as the specific responsibilities and duties assigned and to be undertaken by the apprentice.

Assessment Booking

Applications for any reasonable adjustments and/or special considerations should be submitted prior to Gateway, to allow time to review the request before the planning meeting.

The Innovate Awarding Assessor will book a planning meeting on epaPRO once Gateway documents have been reviewed and approved by us.

The purpose of the meeting is to discuss assessment dates, confirm assessment timings, assessment requirements and assessment preparation. During the meeting the Innovate Awarding Assessor will discuss what happens if assessments are cancelled/rescheduled and how this could impact the EPA period, as well as providing information on certification and appeals.

The Level 7 Game Programmer 45 minute planning meeting will book assessment timeslots for the:

- Project with software artefact/asset output and a presentation with questioning
- Professional discussion underpinned by a portfolio of evidence

The provider will incur a charge for nonattendance of a planning meeting.

After the planning meeting, the apprentice will receive an email confirming everything discussed in the meeting and a calendar invite for all booked assessments. The apprentice will then prepare for EPA.



Employers will ensure their apprentice has compiled a portfolio during the on-programme period of the apprenticeship, which will be submitted at Gateway. It underpins the professional discussion but will not be assessed by us.

We will review the portfolio of evidence in preparation for the professional discussion prior to Gateway. Feedback is not required, although generally if Gateway is rejected due to the portfolio of evidence being inadequate, a courtesy email will be sent with an explanation, including the rejection reason on epaPRO.

Portfolio of evidence content and format are typically Word documents,





Portfolio of evidence requirements:

- Apprentices must compile a portfolio of evidence during the on-programme period of the apprenticeship
- It must contain evidence related to the KSBs that will be assessed by the professional discussion
- The portfolio of evidence will typically contain 12 discrete pieces of evidence
- Evidence must be mapped against the KSBs
- Evidence may be used to demonstrate more than one KSB: a qualitative as opposed to a quantitative approach is suggested

End-Point Assessment

Assessment Methods

Assessment Method 1

Project with software artefact/asset output and a presentation with questioning

The project involves the apprentice completing a significant and defined piece of work that has a real business application and benefit. The project must start after the apprentice has gone through Gateway.

The project should be designed to ensure that the apprentice's work meets the needs of the employer's business, is relevant to their role and allows the relevant KSBs to be the assessed for the EPA. The employer must ensure it has a real business application and Innovate Awarding will ensure it meets the requirements of

the EPA, including suitable coverage of the KSBs assigned to this assessment method.

This assessment method has two components:

- A project with a software artefact/ asset output
- A presentation with questions and answers

Please see Annex 3 for Assessment Method Grading Descriptors.



Assessment Method 1, Component 1 Project with a software artefact/asset output

As each programmer will engineer many different technical systems as part of the development of a complete game and as the project cycle for games is often too long to assess a complete product, this assessment requires the apprentice to work on the programming of a defined project that can be completed within a 12 week period. Although it isn't compulsory for this system to be assessed in isolation from its associated product, this may be necessary when the wider product is incomplete or subject to confidentiality requirements.

The employer will be asked to decide on the project with the apprentice and submit an outline to us for approval. This approval is designed to ensure that its scope offers the apprentice the opportunity to meet all the knowledge, skills and behaviours allocated to this assessment method.

As the output from the project, the apprentice is required to produce a software artefact/asset which they will submit for marking and formally present to the Innovate Awarding Assessor.

The apprentice must start the project after Gateway.

They must complete and submit the software artefact to us after a maximum of 12 weeks. The employer

will ensure the apprentice has the time and resources within this period, to plan and complete their project. The apprentice must complete their project and the production of all its components unaided.

The apprentice may work as part of a team which could include technical internal or external support. However, the project output must be the apprentice's own work and will be reflective of their own role and contribution. The apprentice and the employer must both confirm that the project output(s) is the apprentice's own work when it is submitted.

The minimum requirements for the software artefact/asset for both the Game Software Programmer and Game Technology Programmer are:

- A complete working technical system, or collection of systems which executes and produces a verifiable outcome. Verification may be achieved through a test harness or other code framework which is not of the apprentice's own creation, but the technical system itself must be all their own work.
- Typically, it would be supported by a code repository evidencing its iterative development by the apprentice over the assessment period, and not just the final codebase.

Typically the software artefact would • be a real-time system, but it could also be something which creates data for or from a real-time system.

The project may be based on:

- A specific problem
- A recurring issue
- An idea or opportunity
- A development for a live product where it is appropriate to do so Where client confidentiality requires it the system may be demonstrated in a test harness or using placeholder/white box assets which conceal the product and/or client





Assessment Method 1 Component 2 Presentation of project outcome with questioning

Apprentices will be required to produce, submit and deliver a presentation on their software artefact/asset. A copy of the presentation must be submitted to us at the same time as the software artefact/asset; 12 weeks after Gateway.

The Innovate Awarding Assessor will have a minimum of two weeks to review the software artefact/asset and the apprentice's presentation in order to prepare appropriate questions.

As a minimum, the apprentice's presentation must include:

- An overview of the project and the resulting software artefact/asset
- The project scope (including key performance indicators)
- Summary of actions undertaken by the apprentice
- Project outcomes and how these • were achieved

The presentation and questioning will last for 90 minutes (+/-10%) and most likely take place via video conferencing. The apprentice should plan their presentation to last for 45 minutes and expect a further 45 minutes of questioning.

The purpose of questioning is:

- To verify that the software artefact/ asset was created by the apprentice
- To follow up on any knowledge, skill and behaviour areas that the assessor feels haven't been sufficiently covered in the presentation

The Innovate Awarding Assessor will ask at least five main questions with follow up questions where appropriate. The questions will be open and holistic.

To deliver the presentation, the apprentice will require access to:

- A PowerPoint or equivalent presentation software
- Source control archives for the project or suitable visual evidence of their use
- An appropriate development environment for explaining and demonstrating code
- Computer with internet connection

Assessment Method 2 Professional discussion, underpinned by a portfolio

In a professional discussion, the Innovate Awarding Assessor and apprentice will have a formal two-way conversation. It gives the apprentice the opportunity to demonstrate their competences across the apprenticeship and beyond those evidenced by the project.

Whilst programmers in the games industry spend most of their time developing software, it is their ability to work productively with a much wider team of creative people that determines their real value to a game studio. As such this assessment allows apprentices to draw upon a wider portfolio of work to relate their knowledge, skills and behaviours to experiences involving interdisciplinary teamworking and professionalism.

Apprentices must have access to their portfolio of evidence and are encouraged to refer to this to illustrate their answers. The Innovate Awarding Assessor will have already viewed the portfolio, but it is important to note that it is not directly assessed.

The professional discussion will last for 90 minutes (+/- 10%), and the Innovate Awarding Assessor will ask at least 10 main open and holistic questions with follow up questions where appropriate and for clarification.

The professional discussion will most likely take place via video conferencing.

Please see Annex 3 for Assessment Method Grading Descriptors.



Grading

Performance in the EPA determines the apprenticeship grade of:

- Distinction
- Merit
- Pass •
- Fail •

The Innovate Awarding Assessor will grade the project with presentation and questions and the professional discussion underpinned by a portfolio of evidence.

Innovate Awarding will combine the individual assessment method grades to determine the overall EPA grade.

To achieve an overall distinction, apprentices must achieve distinction in both assessment methods.

Project with software artefact/asset output and a presentation with questioning	Professional Discussion underpinned by a portfolio of evidence	Overall Grading
Distinction	Distinction	Distinction
Distinction	Pass	Merit
Pass	Distinction	Merit
Pass	Pass	Pass
Any grade	Fail	Fail
Fail	Any grade	Fail

To achieve an overall merit, apprentices must achieve a pass in one assessment method and a distinction in the other.

To achieve an overall pass, the apprentice must achieve at least a pass in all the assessment methods.

If the apprentice fails one or more assessment methods, they will be awarded an overall fail.

Grades from individual assessment methods must be combined in the following way to determine the grade of the EPA overall.

Annex 1

Assessment Plan and **Occupational Standard**

The Level 7 Game Programmer Apprenticeship Standard and the latest version of the Assessment Plan can be accessed using this link:

https://www.instituteforapprenticeships.org/apprenticeshipstandards/game-programmer-v1-2

Level 7 Game Programmer Standard ST0953 Version 1.2 Sector: Digital **EQA** Organisation: Ofgual



Annex 2 **Additional** Information

Results and Certifications

All final assessment component results are published on epaPRO within 7 working days of the assessment taking place.

We will submit a certificate claim with the ESFA within 15 working days after the final result has been uploaded to epaPRO. The ESFA will send the certificate directly to you.

For replacement certificates a request must be emailed to epa@innovateawarding.org. Within two days of receiving the email, a replacement certificate will be requested from the ESFA.

Re-sits and **Re-takes**

Apprentices who fail one or more assessment method will be offered the opportunity to take a re-sit or a retake. A re-sit does not require further learning, whereas a re-take does.

Apprentices should have a supportive action plan to prepare for the re-sit or a re-take. The apprentice's employer will need to agree that either a re-sit or retake is an appropriate course of action.

An apprentice who fails an assessment method, and therefore the EPA in the

first instance, will be required to resit or re-take any failed assessment methods only. In the event of a resit/ retake the apprentice must amend the project output in line with the Innovate Awarding Assessors feedback but can use the same portfolio of evidence. The apprentice will be given two weeks to rework and submit the amended project output.

Any assessment method re-sit or re-take must be taken during the maximum EPA period, otherwise the entire EPA must be taken again, unless in the opinion of the EPAO exceptional circumstances apply outside the control of the apprentice or their employer.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to distinction.

Where any assessment method has to be re-sat or re-taken, the apprentice will be awarded a maximum EPA grade of pass, unless the EPAO determines there are exceptional circumstances requiring a re-sit or re-take.

✤ Reasonable Adjustments, Special **Considerations and Appeals**

Information on reasonable adjustments, special considerations and the appeals process can be accessed by using this link:

https://innovateawarding.org/ end-point-assessment/apprenticeinformation

Annex 3 Support Materials

Assessment Method 1 Grading Descriptor Game Technology Programmer Assessment Method 1: Project with presentation and questions



Assessed Criteria	Pass Grading Descriptor	Distinction Grading Descriptor	S8 Write robust, well-tested, maintainable code which is easy to adapt to changing	The Project application demonstrates the use of a well-tested, maintainable	Critically evaluates the ability of their code to be maintained and its potential to be	
CORE: Programming Competencies			requirements.	code which can be adapted to changing requirements and adopts an industry	adapted to changing requirements. (S8 S9)	
K1 How to approach the development of interactive, real-time applications for gaming platforms, including an awareness of industry-standard programming languages, application programming interfaces (APIs), tools, engines and frameworks.	The Project incorporates the development of an interactive real time application for a gaming platform which uses the syntax and structure of an industry standard programming language. (K1 K2 S1)	development lication for the syntax andard 2 S1) Critically evaluates their application design justifying their choice of language features and APIs. (K1 K2 S1)	Critically evaluates their application design justifying their choice of language features and APIs. (K1 K2 S1)	S9 Use an industry-standard version control system.	standard version control system. (S8 S9)	
K2 The syntax and structure of an industry- standard programming language (above and beyond visual programming languages) used for the development of games (for example			S16 Follow studio coding best-practices and participate in keeping them relevant and up to date.	The Project demonstrates up to date studio coding methods/techniques which the apprentice can justify as being current and relevant. (S16)	N/A	
C++, C#). S1 Program interactive, real-time applications for gaming platforms using an industry-standard programming language, incorporating APIs, tools, engines or frameworks appropriate to employer requirements.			B1 Reliable, objective and capable of independent working.	Acts independently in applying objective judgements to create the application within given time constraints. (B1)	N/A	
K9 Common principles of good software design applied in the games industry including contrasting approaches and priorities (e.g. object-oriented vs. data-oriented).	The Project application is created using the common principles of games industry software design. (K9)	N/A				

Assessment Method 1: Project with presentation and questions



Assessment Method 1: Project with presentation and questions



C	CORE: Debugging, Profiling and Optimisation	on
K6 How to use tools to identify and optimise performance bottlenecks in real-time applications.	The Project outlines the tools used to identify and optimise performance bottlenecks. (K6)	Evaluates the tools used to identify and optimise performance bottlenecks. (K6)
K7 The role of debugging tools, crash reports, automated testing and continuous integration workflows in creating robust software.	The Project demonstrates the use of debugging tools, crash reports, automated testing and continuous integration workflows. (K7 S6)	Critically analyses the role of debugging tools, crash reports, automated testing and continuous integration workflows. (K7 S6)
S3 Use profiling tools and techniques to achieve, monitor and maintain an acceptable real-time framerate for an interactive game.	The Project demonstrates the use of profiling tools and techniques, tracking of memory usage and identifies opportunities to reduce requirements. (S3 S4)	Critically analyses the application of profiling tools and techniques to achieve, monitor and maintain real-time frame rate. (S3)
S4 Track memory usage and identify opportunities for reducing requirements.		
S6 Use debugging tools and automated testing systems to develop robust code bases.		
B7 A strong work ethic and commitment in order to meet the standards required.	Establishes a commitment to the standard produced in work tasks which reflects the guidelines set out by the company or organisation. (B7)	N/A



Annex 3 Support Materials

Assessment Method 1 Grading Descriptor Game Software Programmer

Assessment Method 1: Project with presentation and questions



Assessed Criteria	Pass Grading Descriptor	Distinction Grading Descriptor	S8 Write robust, well-tested, maintainable code which is easy to adapt to changing	The Project application demonstrates the use of a well-tested, maintainable	Critically evaluates the ability of their code to be maintained and its potential to be	
CORE: Programming Competencies			requirements.	code which can be adapted to changing requirements and adopts an industry	adapted to changing requirements. (S8 S9)	
K1 How to approach the development of interactive, real-time applications for gaming platforms, including an awareness of industry-standard programming languages, application programming interfaces (APIs), tools, engines and frameworks.	The Project incorporates the development of an interactive real time application for a gaming platform which uses the syntax and structure of an industry standard programming language. (K1 K2 S1)	development lication for the syntax andard 2 S1) Critically evaluates their application design justifying their choice of language features and APIs. (K1 K2 S1)	Critically evaluates their application design justifying their choice of language features and APIs. (K1 K2 S1)	S9 Use an industry-standard version control system.	standard version control system. (S8 S9)	
K2 The syntax and structure of an industry- standard programming language (above and beyond visual programming languages) used for the development of games (for example			S16 Follow studio coding best-practices and participate in keeping them relevant and up to date.	The Project demonstrates up to date studio coding methods/techniques which the apprentice can justify as being current and relevant. (S16)	N/A	
C++, C#). S1 Program interactive, real-time applications for gaming platforms using an industry-standard programming language, incorporating APIs, tools, engines or frameworks appropriate to employer requirements.			B1 Reliable, objective and capable of independent working.	Acts independently in applying objective judgements to create the application within given time constraints. (B1)	N/A	
K9 Common principles of good software design applied in the games industry including contrasting approaches and priorities (e.g. object-oriented vs. data-oriented).	The Project application is created using the common principles of games industry software design. (K9)	N/A				

Assessment Method 1: Project with presentation and questions



Assessment Method 1: Project with presentation and questions



	CORE: Debugging, Profiling and Optimisati	on
K6 How to use tools to identify and optimise performance bottlenecks in real-time applications.	The Project outlines the tools used to identify and optimise performance bottlenecks. (K6)	Evaluates the tools used to identify and optimise performance bottlenecks. (K6)
K7 The role of debugging tools, crash reports, automated testing and continuous integration workflows in creating robust software.	The Project demonstrates the use of debugging tools, crash reports, automated testing and continuous integration workflows. (K7 S6)	Critically analyses the role of debugging tools, crash reports, automated testing and continuous integration workflows. (K7 S6)
S3 Use profiling tools and techniques to achieve, monitor and maintain an acceptable real-time framerate for an interactive game	The Project demonstrates the use of profiling tools and techniques, tracking of memory usage and identifies opportunities to reduce requirements (S3 S4)	Critically analyses the application of profiling tools and techniques to achieve, monitor and maintain real-time frame rate.
S4 Track memory usage and identify opportunities for reducing requirements.	to reduce requirements. (55 54)	
S6 Use debugging tools and automated testing systems to develop robust code bases.		
B7 A strong work ethic and commitment in order to meet the standards required.	Establishes a commitment to the standard produced in work tasks which reflects the guidelines set out by the company or organisation. (B7)	N/A



Annex 3 Support Materials

Assessment Method 2 Grading Descriptor Game Technology Programmer



Assessed Criteria	Pass Grading Descriptor	Distinction Grading Descriptor	K11 How to use version control and project management tools to plan and coordinate	Demonstrates the application of version control and project management tools in	Evaluates and ju version control
	CORE: Real-Time Graphical Applications		the delivery of development tasks.	the role of a developer. (K11 S10)	tools in the role of a develo
K3 The fundamental graphical and mathematical principles that underpin the	Applies and adapts real time algorithms in two and/or three dimensions. (K3 S2)	N/A	S10 Use an industry-standard project management system from the perspective of a developer.		
operation of real-time graphics in two and three-dimensions.			K12 Common development methodologies and how they are applied in game	Demonstrates the application of industry standard game development	Critically evaluate industry standard
S2 Implement and adapt contemporary			development.	methodologies. (K12 S12)	methodologies. (K
dimensional games.	es. S12 Apply industry-standard and three-		S12 Apply industry-standard development		
K4 The characteristics of modern hardware	Demonstrates code which is informed	Critically evaluates their approach to creating interactive real- time graphical applications for modern hardware platforms. (K4 S5)	practice.		
platforms and how they support the efficient function of interactive, real-time graphical applications	by the characteristics of a hardware creating interactive real- time graphical applications for modern hardware platform (K4 S5)		K15 The role of rapid prototyping and agile approaches in innovation.	Describes the role of rapid prototyping and agile approaches in innovation. (K15)	N/A
S5 Write code informed by the characteristics of modern hardware platforms (e.g. shader programming, multi- threading)			S7 Use continuous integration workflow within the deployment lifecycle as part of a multi-disciplinary software team.	Demonstrates the use of a continuous integration workflow within the deployment lifecycle as part of a multidisciplinary software team. (S7)	N/A
K5 Approaches balancing quality and performance requirements to achieve, monitor and maintain acceptable frame	Balances quality and performance to achieve, monitor and maintain frame rates and memory footprints (K5)	Evaluates how quality and performance are balanced to achieve, monitor and maintain frame rates and memory footprints (K5)	S17 Give and receive feedback in code reviews in an objective and professional manner.	Describes the giving and receiving of feedback in code reviews in an objective and professional manner. (S17)	N/A
rates and memory footprints for a real-time interactive application.				CORE: Creative Teams and Asset Workflow	IS
C	ORE: Project Management and Methodolog	gies	K10 How a complete asset pipeline for a game operates, including the technical	Explains how an asset pipeline works for a game. (K10)	N/A
K8 The role of staged deployment, monitoring and analytics in releasing, tracking and rofining games	Describes the role of staged deployment, monitoring and analytics in releasing, tracking and rofining games (K8)	N/A	requirements, processing stages and tools involved in bringing assets into the game.		





K13 The broad range of roles involved in the game development process, and	Outlines the multi-disciplinary roles involved in the game development process and	N/A		CORE: Professionalism			
the different strengths and perspectives that multi-disciplinary teams bring to the creative process.	evaluates their value in the production of a game. (K13)			K14 Where to find information on the latest technological innovations for the games industry.	Describes the sources of information for the latest innovations for the games industry and identifies the opportunities and threats	N/A	
K18 The business stakeholders in a project and how multi-disciplinary development teams can generate value within the context of different business models.	Identifies the business stakeholders and business models for their own projects which can generate value. (K18)	Reflects on their management of stakeholders and multi-disciplinary teams justifying how their approach generates value within the context of a business		S15 Research, document and articulate the opportunities and threats presented by new industry technologies.	presented by new technologies. (K14 S15)	Critically evaluates the current opportunities and threats to the organisation presented by new technologies. (S15)	
S11 Adapt or extend existing tool chains to support new features and/or optimise workflows.	Demonstrates the management of complex relationships with diverse stakeholders, leading modifications to existing tool chains	N/A		K16 The organisation's standards with respect to coding, documentation and issue tracking, and how they relate to wider practice in the software industries.	Outlines the organisation's standards on coding, documentation and issue tracking and relates them to software industry practices. (K16)	N/A	
S13 Manage complex relationships with diverse stakeholders and communicate information effectively to different audiences.	or optimisations to workflows, and manages the associated communication, selecting technical and/or non-technical language in reflection of the audience. (S11 S13 S14)			K17 Publishers' technical requirements for target platforms, where to obtain them and the tools and systems available to support developers to meet those requirements.	Understands publishers' technical requirements for target platforms and where to obtain information and support. (K17)	N/A	
S14 Provide technical leadership and direction with respect to the workflow of other team members.						K19 Relevant data protection laws including GDPR.	Describes relevant data protection laws and practices, evaluates their relevance to the games industry and their relationship to
B3 Respect for other disciplines and an understanding of the role of diverse experiences and backgrounds in a	Establishes an approach to working with colleagues within their own and related disciplines that follows the ethical	N/A	-	K20 Security approaches to prevent products being compromised, and everyday good practice in security including password policies, phishing and use of VPNs.	security. (K19 K20)		
successful creative process.	sful creative process. guidelines/policies/procedures set out by the industry/organisation. (B3)		B4 Commitment to continuous professional development; maintaining their knowledge and skills in relation to technology developments and sharing best practice in their organisation around all aspects of game development.	Assumes responsibility for their personal development and records show the expertise gained is used to share with colleagues. (B4)	N/A		







B5 Maintains awareness of trends and innovations in the subject area, utilizing a range of academic literature, online sources, community interaction and conference attendance.	Uses a range of sources of information to demonstrate awareness of current trends in the gaming sector. (B5)	N/A
B6 Acts with integrity with respect to ethical, legal and regulatory ensuring the protection of personal data, safety and security.	Establishes a workplace approach to personal data, safety, and security which follows ethical, legal and regulatory guidelines for the industry/sector/ organisation. (B6)	N/A
	OPTION: Game Technology Programmer	
K24 The specialist operation of a specific hardware architecture or gaming platform and how to engineer efficient solutions which target its specific capabilities.	Describes the specialist operation of specific hardware architectures or gaming platforms and how to engineer optimal solutions which target its specific capabilities. (K24)	Critically compares hardware architecture or gaming platforms from other organisations with those used in-house. (K24)
K25 How to balance the requirements and availability of team resources (staff time, software licencing) with respect to providing the maximum benefit to their users.	Understands the trade-offs in time and resources to provide maximum benefit to users. (K25)	N/A
K26 How to use externally facing support portals and project tracking tools in order to effectively track and document technologies for sharing with a wide user- base.	be to use externally facing support and project tracking tools in to effectively track and document blogies for sharing with a wide user- blogies for sharing wide user- blogi	
S26 Communicate and evangelise technology solutions to promote engagement and uptake among the user- base.	Communicates and evangelises the technology solutions and promotes engagement and uptake among the userbase. (S26)	N/A



S27 Profile and optimise code created by their technology users.	Demonstrates the profiling and optimisation of code created by their technology users. (S27)	N/A
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Annex 3 Support Materials

Assessment Method 2 Grading Descriptor Game Software Programmer



Assessed Criteria	Pass Grading Descriptor	Distinction Grading Descriptor	K11 How to use version control and project management tools to plan and coordinate	Demonstrates the application of version control and project management tools in	Evaluates and ju version control
	CORE: Real-Time Graphical Applications		the delivery of development tasks.	the role of a developer. (K11 S10)	tools in the role of a develo
K3 The fundamental graphical and mathematical principles that underpin the	Applies and adapts real time algorithms in two and/or three dimensions. (K3 S2)	N/A	S10 Use an industry-standard project management system from the perspective of a developer.		
operation of real-time graphics in two and three-dimensions.			K12 Common development methodologies and how they are applied in game	Demonstrates the application of industry standard game development	Critically evaluate industry standard
S2 Implement and adapt contemporary			development.	methodologies. (K12 S12)	methodologies. (K
dimensional games.	es. S12 Apply industry-standard and three-		S12 Apply industry-standard development		
K4 The characteristics of modern hardware	Demonstrates code which is informed	Critically evaluates their approach to creating interactive real- time graphical applications for modern hardware platforms. (K4 S5)	practice.		
platforms and how they support the efficient function of interactive, real-time graphical applications	by the characteristics of a hardware creating interactive real- time graphical applications for modern hardware platform (K4 S5)		K15 The role of rapid prototyping and agile approaches in innovation.	Describes the role of rapid prototyping and agile approaches in innovation. (K15)	N/A
S5 Write code informed by the characteristics of modern hardware platforms (e.g. shader programming, multi- threading)			S7 Use continuous integration workflow within the deployment lifecycle as part of a multi-disciplinary software team.	Demonstrates the use of a continuous integration workflow within the deployment lifecycle as part of a multidisciplinary software team. (S7)	N/A
K5 Approaches balancing quality and performance requirements to achieve, monitor and maintain acceptable frame	Balances quality and performance to achieve, monitor and maintain frame rates and memory footprints (K5)	Evaluates how quality and performance are balanced to achieve, monitor and maintain frame rates and memory footprints (K5)	S17 Give and receive feedback in code reviews in an objective and professional manner.	Describes the giving and receiving of feedback in code reviews in an objective and professional manner. (S17)	N/A
rates and memory footprints for a real-time interactive application.				CORE: Creative Teams and Asset Workflow	IS
C	ORE: Project Management and Methodolog	gies	K10 How a complete asset pipeline for a game operates, including the technical	Explains how an asset pipeline works for a game. (K10)	N/A
K8 The role of staged deployment, monitoring and analytics in releasing, tracking and rofining games	Describes the role of staged deployment, monitoring and analytics in releasing, tracking and rofining games (K8)	N/A	requirements, processing stages and tools involved in bringing assets into the game.		





K13 The broad range of roles involved in the game development process, and	Outlines the multi-disciplinary roles involved in the game development process and	N/A		CORE: Professionalism			
the different strengths and perspectives that multi-disciplinary teams bring to the creative process.	evaluates their value in the production of a game. (K13)			K14 Where to find information on the latest technological innovations for the games industry.	Describes the sources of information for the latest innovations for the games industry and identifies the opportunities and threats	N/A	
K18 The business stakeholders in a project and how multi-disciplinary development teams can generate value within the context of different business models.	Identifies the business stakeholders and business models for their own projects which can generate value. (K18)	Reflects on their management of stakeholders and multi-disciplinary teams justifying how their approach generates value within the context of a business		S15 Research, document and articulate the opportunities and threats presented by new industry technologies.	presented by new technologies. (K14 S15)	Critically evaluates the current opportunities and threats to the organisation presented by new technologies. (S15)	
S11 Adapt or extend existing tool chains to support new features and/or optimise workflows.	Demonstrates the management of complex relationships with diverse stakeholders, leading modifications to existing tool chains	N/A		K16 The organisation's standards with respect to coding, documentation and issue tracking, and how they relate to wider practice in the software industries.	Outlines the organisation's standards on coding, documentation and issue tracking and relates them to software industry practices. (K16)	N/A	
S13 Manage complex relationships with diverse stakeholders and communicate information effectively to different audiences.	or optimisations to workflows, and manages the associated communication, selecting technical and/or non-technical language in reflection of the audience. (S11 S13 S14)			K17 Publishers' technical requirements for target platforms, where to obtain them and the tools and systems available to support developers to meet those requirements.	Understands publishers' technical requirements for target platforms and where to obtain information and support. (K17)	N/A	
S14 Provide technical leadership and direction with respect to the workflow of other team members.						K19 Relevant data protection laws including GDPR.	Describes relevant data protection laws and practices, evaluates their relevance to the games industry and their relationship to
B3 Respect for other disciplines and an understanding of the role of diverse experiences and backgrounds in a	Establishes an approach to working with colleagues within their own and related disciplines that follows the ethical	N/A	-	K20 Security approaches to prevent products being compromised, and everyday good practice in security including password policies, phishing and use of VPNs.	security. (K19 K20)		
successful creative process.	sful creative process. guidelines/policies/procedures set out by the industry/organisation. (B3)		B4 Commitment to continuous professional development; maintaining their knowledge and skills in relation to technology developments and sharing best practice in their organisation around all aspects of game development.	Assumes responsibility for their personal development and records show the expertise gained is used to share with colleagues. (B4)	N/A		



Assessment Method 2: Professional discussion



B5 Maintains awareness of trends and innovations in the subject area, utilizing a range of academic literature, online sources, community interaction and conference attendance.	Uses a range of sources of information to demonstrate awareness of current trends in the gaming sector. (B5)	N/A
B6 Acts with integrity with respect to ethical, legal and regulatory ensuring the protection of personal data, safety and security.	Establishes a workplace approach to personal data, safety, and security which follows ethical, legal and regulatory guidelines for the industry/sector/ organisation. (B6)	N/A
OPTION: Game Software Programmer		
K21 The relative merits of different game engines, third-party frameworks and tools, and when to use them to speed up the development process.	Evaluates different game engines, third- party frameworks and tools with respect to accelerating the game development process. (K21)	Critically compares the relative merits of alternative game engines, third-party frameworks and tools with those used in house. (K21)
K22 How to balance the requirements and availability of team resources (for example staff time, software licencing) with respect to the engineering and maintenance of a game's asset pipeline.	Understands the trade-offs in time and resources that underpin the engineering and maintenance of a game's asset pipeline. (K22)	N/A
K23 The range of different disciplines involved in the development process and their typical skillsets and expectations in terms of technologies, tools and asset formats.	Distinguishes the typical skillsets and expectations of different disciplines involved in the development process in terms of technologies, tools and asset formats. (K23)	Evaluates the role of different disciplines involved in the development process and their typical skillsets and expectations in terms of technologies, tools and asset format. (K23)
S21 Work as part of interdisciplinary teams.	Demonstrates working in an interdisciplinary team on game programming. (S21)	N/A
S22 Create innovative game mechanics for which solutions are unknown.	The software implements game mechanics which solve problems where solutions were previously unknown. (S22)	Evaluates their solutions to design problems. (S22)



Level 7 Game Programmer

Innovate Awarding Assessment Specification

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