



Australian Government

ICTGAM535 Develop complex 3-D software for games and interactive media

Release: 1

ICTGAM535 Develop complex 3-D software for games and interactive media

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 6.0.

Application

This unit describes the skills and knowledge required to employ multiple 3-D frameworks and libraries, build a graphical user interface (GUI) and develop complex 3-D software with documentation generated using applicable tools.

It applies to programmers who support the design, development and programming of 3-D media and digital games as part of a larger development team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Game development

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Define 3-D software requirements and prepare to develop software	1.1 Establish complex 3-D software requirements and applicable legislative and organisational standards 1.2 Employ integrated development environment facilities and include existing 3-D, audio and physics libraries applicable to games or interactive media production 1.3 Configure a 3-D environment compatible with specified platform using existing library facilities and applicable language 1.4 Research and select applicable frameworks or games engine applicable to complex 3-D software requirements
2. Use multiple frameworks	2.1 Instantiate virtual objects in complex 3-D environment

ELEMENT	PERFORMANCE CRITERIA
provided or engines	2.2 Import complex pre-constructed models retrieved from persistent storage into 3-D environment using scripts and library routines 2.3 Animate 3-D objects required by game play and handle collisions between objects in 3-D environment using code 2.4 Generate code and manipulate 3-D objects texturing and other attributes of models during run-time execution 2.5 Incorporate environmental elements and enhance user experience according to project requirements 2.6 Apply functionality to 3D game objects by modifying or extending existing classes 2.7 Select and use exception handling techniques and confirm program stability in complex 3-D environment that uses multiple libraries
3. Create complex GUI for 3-D environment	3.1 Employ integrated development environment facilities and include existing 3-D compatible GUI controls applicable to complex games or interactive media production 3.2 Combine predefined GUI elements and create complex interface for 3-D environment according to project requirements 3.3 Modify scripts and code and customise existing GUI elements according to project requirements 3.4 Write code that processes events raised by complex GUI in 3-D environment 3.5 Create GUI events and modify configuration of complex 3-D environment
4. Debug and finalise complex 3-D software	4.1 Use stand-alone debugging tools and tools provided by integrated development environment and examine variables and trace running code across multiple libraries 4.2 Employ debugging facilities according to organisational procedures 4.3 Seek feedback from required personnel and amend as required 4.4 Identify and choose applicable integrated or third-party documentation tools 4.5 Create and maintain code documentation for complex 3-D project using selected integrated or third-party tools 4.6 Obtain final sign-off from required personnel

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

Skill	Description
Reading	Interprets and comprehends instructions, briefs, technical and conceptual information to inform job requirements
Writing	Writes and customises precise code using specialised language, industry-approved coding techniques and programming practices
Numeracy	Uses whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading and other variables
Planning and organising	Plans, organises and completes work according to defined requirements and schedules taking responsibility for decisions and sequencing tasks
Self-management	- Sources, analyses and evaluates applications and tools with potential to meet development and coding requirements - Takes responsibility for data integrity and management
Technology	Identifies purposes and uses key features of specific digital systems and tools and operates them to complete complex development tasks

Unit Mapping Information

Supersedes and is equivalent to ICTGAM507 Develop intermediate 3-D software for games and interactive media and ICTGAM508 Develop complex 3-D software for games and interactive media.

Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTGAM535 Develop complex 3-D software for games and interactive media

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- develop at least one complex 3-D software according to client specifications, on at least one occasion.

In the course of the above, the candidate must:

- employ multiple 3-D frameworks, engines and libraries
- create mesh primitives using 3-D library routines
- generate code and manipulate 3-D objects, including cameras, lights and mesh primitives
- use virtual objects in 3-D environments, including:
 - audio managers
 - cameras
 - lights
 - physics managers
 - viewports
- animate 3-D objects required by game play and:
 - include animation selection/playback for pre-constructed models
 - be based on user input
 - be driven by code
 - include dynamic camera movement as required by game play
- build a complex graphical user interface (GUI) for a 3-D environment
- select and deploy documentation tools
- create and maintain code documentation using applicable tools
- detect logical and coding errors and debug application as required
- comply with legislative and organisational standards.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- processes involved in complex 3-D software development
- legislative and organisational standards applicable to development of complex 3-D software
- configuration processes for 3-D environments, including:
 - device selection
 - game resolution
 - screen colour depth
 - output performance including:
 - anti-aliasing
 - level of detail
 - filtering
 - caustics and refraction
- use of scripts and library routines in 3-D software development environments
- techniques for using multiple games-oriented libraries
- environmental elements in complex 3-D software and impacts on users
- handling and debugging techniques used when developing 3-D software for games and interactive media
- documentation techniques applicable to 3-D software development process
- object-oriented 3-D programming concepts and language
- techniques for using a graphical user interface (GUI) to interact with a user.

Assessment Conditions

Skills in this unit must be demonstrated in a workplace or simulated environment where the conditions are typical of those in a working environment in this industry.

This includes access to:

- project brief
- software, hardware and 3-D equipment required in developing complex 3-D software for games and interactive media
- integrated development environment facilities
- integrated or third-party documentation tools
- technical manuals and materials applicable to complex 3-D software development
- existing multiple frameworks, search engines or games-oriented libraries.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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