



Australian Government

ICTGAM509 Design interactive 3-D applications for scientific and mathematical modelling

Release: 1

ICTGAM509 Design interactive 3-D applications for scientific and mathematical modelling

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 1.0.

Application

This unit describes the skills and knowledge required to design interactive 3-D applications for scientific and mathematical modelling.

It applies to individuals with object-oriented programming skills working in any industrial context that requires 3-D computer simulation of a well-defined environment, system or set of relationships.

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. Determine and confirm business expectations and needs	1.1 Apply skills to determine business requirements and verify the accuracy of the information gathered 1.2 Determine the critical environmental, systemic relationships that require simulation in a 3-D environment 1.3 Identify critical data sources required by simulations or modelling 1.4 Document critical environmental, systemic relationships and data sources that require simulation in a 3-D environment
2. Design an interactive	2.1 Use prototyping tools to provide proof of concept for

ELEMENT	PERFORMANCE CRITERIA
3-D application for scientific or mathematical modelling	environmental and systemic relationships 2.2 Identify technologies and platforms suitable for the deployment of scientific or mathematical modelling 2.3 Apply object-oriented programming principles to design classes and algorithms to support scientific or mathematical modelling in an interactive 3-D environment
3. Design a 3-D environment that simulates a scientific or mathematical model	3.1 Select appropriate visual representation for elements of a 3-D scientific or mathematical model 3.2 Analyse required interaction between user and a 3-D environment 3.3 Design a graphical user interface (GUI) to support required interaction between use and a 3-D environment
4. Develop procedures to test a scientific or mathematical model	4.1 Develop testing procedures and standards that verify modelling integrity writing, 4.2 Document testing procedures and standards that verify modelling integrity

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.1, 1.2	Interprets, analyses and comprehends instructions, briefs, technical and conceptual information to inform job requirements.
Writing	1.4, 2.3, 4.1, 4.2	- Writes and customises precise code using specialised language, industry-approved coding techniques, and programming practices - Verifies modelling integrity, by documenting testing procedures that explore expected results, parallel processing and test data
Numeracy	2.2, 2.3, 3.3, 4.1, 4.2	- Uses whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading, and other variables during application phase - Designs complex algorithms

Get the work done	1.1-1.4, 2.1-2.3, 3.1-3.3, 4.1, 4.2	- Plans, organises and completes work according to defined requirements and schedules taking responsibility for decisions, and sequencing tasks to achieve efficient outcomes - Takes responsibility for decisions regarding end-product evaluation, data integrity and management - Understands the purposes and uses key features of specific digital systems and tools, and operates them effectively to complete development tasks
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Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTGAM509 Design interactive 3-D applications for scientific and mathematical modelling	ICAGAM509A Design interactive 3-D applications for scientific and mathematical modelling	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTGAM509 Design interactive 3-D applications for scientific and mathematical modelling

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Performance Evidence

Evidence of the ability to:

- determine business requirements and select data to be used in a 3-D computer simulation or mathematical modelling application
- design an interactive 3-D environment that reflects scientific or mathematical modelling
- develop and document testing procedures and standards to verify modelling.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- provide a detailed explanation of documentation techniques
- outline object-oriented 3-D programming design methodologies
- summarise object-oriented 3-D programming principles
- discuss data sources and business expectations and needs
- explain techniques for using a graphical user interface (GUI) to interact with a user
- provide a detailed summary of testing procedures
- describe how 3-D technologies can simulate scientific or mathematical models.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the game development field of work, and include access to:

- suitable 3-D equipment, software and hardware
- technical manuals
- examples of scientific or mathematical models.

Assessors must satisfy NVR/AQTF assessor requirements.

Links

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