



Australian Government

ICTGAM536 Design interactive 3-D applications for scientific and mathematical modelling

Release: 1

ICTGAM536 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 6.0.

Application

This unit describes the skills and knowledge required to design interactive 3-D applications with applicable environments for scientific and mathematical modelling, according to specifications.

It applies to those 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 Identify business requirements and verify accuracy of gathered information 1.2 Determine task and user requirements according to business needs 1.3 Determine critical environmental and systemic relationships requiring simulation in 3-D environments 1.4 Identify critical data sources required by simulations or modelling 1.5 Document critical environmental and systemic

ELEMENT	PERFORMANCE CRITERIA
	relationships and data sources requiring simulation in 3-D environments
2. Design interactive 3-D applications for scientific and mathematical modelling	2.1 Provide proof of concept for environmental and systemic relationships using prototyping tools 2.2 Identify, analyse and select technologies and platforms suitable for deployment of scientific or mathematical modelling 2.3 Design algorithms according to requirements of scientific or mathematical modelling in interactive 3-D environments
3. Design 3-D environment that simulates a scientific and mathematical model	3.1 Select applicable visual representation for elements of a 3-D scientific or mathematical model according to task requirements 3.2 Analyse required interaction between user and 3-D environment according to task requirements 3.3 Design a graphical user interface (GUI) and support required interaction between user and 3-D environment
4. Test and finalise scientific and mathematical model	4.1 Develop and document testing procedures and standards and verify modelling integrity 4.2 Perform testing and evaluate results and confirm model meets task requirements 4.3 Seek feedback from required personnel and amend model as required 4.4 Document work performed and obtain final sign-off according to organisational procedures

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, analyses 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 - Prepares documentation detailing testing procedures and standards
Numeracy	Uses whole numbers, decimals and percentages when manipulating measurement, scale, ratio, coordinates, colour, shading and other variables

Skill	Description
	during application phase • Designs complex algorithms
Get the work done	• Plans, organises and completes work according to defined requirements and schedules taking responsibility for decisions and sequencing tasks • Takes responsibility for decisions regarding end-product evaluation, data integrity and management • Identifies purposes and uses key features of specific digital systems and tools and operates them to complete development tasks

Unit Mapping Information

Supersedes and is equivalent to ICTGAM509 Design interactive 3-D applications for scientific and mathematical modelling.

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 ICTGAM536 Design interactive 3-D applications for scientific and mathematical modelling

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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:

- design an interactive 3-D application according to scientific and mathematical modelling requirements on at least one occasion.

In the course of the above, the candidate must:

- comply with task and user requirements and organisational procedures
- confirm interactive 3-D environment reflects scientific and mathematical modelling requirements
- confirm functionality of 3-D application for scientific and mathematical modelling on at least two different browsers and at least two different devices.

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:

- documentation techniques applicable to documenting work performed and testing procedures
- object-oriented 3-D programming design methodologies and principles
- features and functions of different prototyping tools applicable to designing interactive 3-D applications
- data sources and business expectations and needs applicable to designing interactive 3-D applications
- different interactions between users and 3-D environments
- techniques for designing and using a graphical user interface (GUI) to interact with users
- organisational and testing procedures applicable to 3-D application design process
- procedures for using 3-D technologies to simulate scientific or mathematical models.

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:

- applicable 3-D equipment, software and hardware
- prototyping tools applicable to designing interactive 3-D applications
- technical manuals
- examples of scientific or mathematical models
- organisational procedures applicable to designing 3-D applications.

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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