



Australian Government

Department of Education, Employment and Workplace Relations

ICAGAM514A Design and create models for a 3-D and digital effects environment

Release: 1

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Modification History

Release	Comments
Release 1	This Unit first released with <i>ICAI1 Information and Communications Technology Training Package version 1.0</i>

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to design and create models for a 3-D and digital effects environment.

Application of the Unit

This unit applies to concept artists, game designers, games programmers, animators and other personnel working in the game development industry.

Licensing/Regulatory Information

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	Performance Criteria
<i>Elements describe the essential outcomes of a unit of competency.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</i>

Elements and Performance Criteria

1. Design and plan a 3-D model	<p>1.1 Research and collect a portfolio of <i>reference material</i></p> <p>1.2 Present portfolio of collected reference material</p> <p>1.3 Use reference material to develop and design a <i>modelling plan</i></p>
2. Use suitable geometry surface for models	<p>2.1 Research different types of geometry to find which choice would be most suitable for 3-D model</p> <p>2.2 Clearly document selected <i>geometry choice</i></p> <p>2.3 Explain, justify and demonstrate reasons for selected geometry choice</p> <p>2.4 Apply selected geometry choice to 3-D model</p> <p>2.5 Make changes where necessary</p>
3. Analyse resource material to construct and apply suitable topology	<p>3.1 Construct and test a topology plan using chosen <i>concept development software</i></p> <p>3.2 Explain or demonstrate reason for choosing particular modelling method</p> <p>3.3 Assess and refine topology plan with client and relevant personnel</p>
4. Construct a 3-D model	<p>4.1 Use modelling plan to construct model in chosen <i>3-D modelling and animation software</i></p> <p>4.2 Build model according to specifications</p> <p>4.3 Present the near finished product to relevant personnel</p> <p>4.4 Accept <i>feedback</i> to incorporate into final design</p> <p>4.5 Assess and refine model with clients and relevant personnel</p> <p>4.6 Compose a <i>report on experience</i> of working on 3-D model</p>

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to:
 - analyse documentation and images to inform implementation of game specifications
 - interpret briefs, work instructions, and technical and conceptual information
- communication skills to:
 - check and confirm design requirements
 - collect, interpret and communicate in visual and written forms effectively for various audiences, including engineers and artists
 - communicate complex designs in a structured format drawn from industry standards, styles and techniques
 - communicate technical requirements related to software development, graphics requirements and code development to supervisors and other team members
 - provide practical advice, support and feedback to colleagues and management
 - translate design requirements into specifications
- initiative and enterprise skills to exercise a high level of creative ingenuity in 3-D design and innovation
- numeracy skills to interpret technical charts, specifications or diagrams relevant to the construction of a 3-D model
- planning and organisational skills to:
 - appropriately refer decisions to a higher project authority for review and endorsement
 - balance talent, experience and budget
 - delegate tasks and responsibility appropriately
 - establish clear roles and goals to achieve required 3-D modelling outcomes
 - meet project deadlines
 - organise equipment and resources to achieve required outcomes
 - organise own time to meet milestones
- problem-solving skills to recognise and address potential quality issues and problems at design development stage
- research skills to undertake technical research into the proper topology and geometry layout for 3-D models
- technical skills to visualise and develop concepts.

Required knowledge

- box, edge-loop and patch modelling
- capabilities and restraints of 3-D modelling packages
- copyright laws and regulations
- digital model development, including specific terminology
- geometry surfaces, including NURBS, Sub-D, Polygon and T-splines
- human resources required in the process of creating a 3-D model, and their respective skills and technology requirements

- methods of sourcing and using reference material
- OHS requirements for ergonomics and electrical safety
- scheduling production components
- technical requirements that hardware imposes on graphics development and requirements, and creative visual design
- topology layouts
- key aspects of modelling plan to build models
- uses of storyboards and scripts.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> • build advanced models according to plans • use specified geometry surfaces • use complex topology layouts.
Context of and specific resources for assessment	<p>Assessment must ensure access to:</p> <ul style="list-style-type: none"> • computer hardware, software, games engines and file storage • copyright and intellectual property legislation • OHS legislation and enterprise policy • appropriate learning and assessment support when required • modified equipment for people with special needs.
Method of assessment	<p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> • direct observation of the learner using 3-D animation software • review of written and verbal reports or documentation showing modelling plan • review of portfolios of evidence • review of third-party workplace reports of learner skills and performance • review of functional 3-D scene files • evaluation of a completed model.
Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, where appropriate.</p> <p>Assessment processes and techniques must be culturally appropriate, and suitable to the communication skill level, language, literacy and numeracy capacity of the candidate and the work being performed.</p> <p>Indigenous people and other people from a non-English speaking background may need additional support.</p> <p>In cases where practical assessment is used it should be combined</p>

	with targeted questioning to assess required knowledge.
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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<p><i>Reference material</i> may include:</p>	<ul style="list-style-type: none"> • blueprints • developmental drawings • internet research • museum information • orthographic images • photographs • schematics • video footage.
<p><i>Modelling and topology plan</i> may include:</p>	<ul style="list-style-type: none"> • blueprints • concept creation • orthographic images • schematics • time management.
<p><i>Geometry choice and modelling method</i> may include:</p>	<ul style="list-style-type: none"> • box modelling • edge-loop modelling • NURBS modelling • patch modelling • polygon modelling • sub-division modelling • T-Spline modelling.
<p><i>Concept development software</i> may include:</p>	<ul style="list-style-type: none"> • Adobe Flash • Adobe Illustrator • ArtGem • ArtRage • Artweaver • Aviary • Corel Draw, Painter, Essentials • Deluxe Paint • GIMP • Grafx • Graphics Gale • ImageForge • Inkscape • Microsoft Paint

	<ul style="list-style-type: none"> • mtpaint • MyPaint • NeoPaint • Open Canvas • Paint Shop Pro • Paint.NET • Photoshop • Synfig • Ulead PhotoImpact • Ultimate Paint.
<i>3-D modelling and animation software</i> may include:	<ul style="list-style-type: none"> • 3ds Max • Blender • Cinema 4D • Houdini • Lightwave • Maya • Modo • XSI • ZBrush.
<i>Feedback</i> may involve:	<ul style="list-style-type: none"> • accepting and responding to comment, critique and suggestions from: <ul style="list-style-type: none"> • clients • colleagues • target audience representatives.
<i>Reporting on experience</i> may involve:	<ul style="list-style-type: none"> • explaining what went wrong • what could be improved, such as: <ul style="list-style-type: none"> • geometry choice • modelling method • modelling plan • topology plan.

Unit Sector(s)

Game development