



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **ICAGAM302A Design and apply simple textures to digital art**

**Release: 1**

## ICAGAM302A Design and apply simple textures to digital art

### Modification History

| Release   | Comments                                                                                                          |
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| Release 1 | This Unit first released with <i>ICA11 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 apply simple textures to digital art, including 3-D models.

### Application of the Unit

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

### 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                                                                                                                                                                                                                                                                                                    |
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| <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

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| 1. Clarify design requirements and plan approach        | <p>1.1 Interpret <b>the brief</b> to clarify design, texture generation and delivery requirements in consultation with <b>client</b></p> <p>1.2 Identify <b>design and technical constraints</b></p> <p>1.3 Identify <b>software</b>, media and file formats for digital imagery and texture production and manipulation</p> <p>1.4 Identify sequence of digital texturing activities in production pipeline</p> <p>1.5 Identify production workflow requirements and develop production pipeline to meet client requirements</p> |
| 2. Assess existing textures and shaders for suitability | <p>2.1 Establish underlying surface characteristics of 3-D model to be textured and shaded</p> <p>2.2 Identify basic <b>shaders</b> and <b>textures</b> with surface characteristics</p> <p>2.3 Identify suitable textures from available texture libraries</p> <p>2.4 Select shaders and textures for assignment to model</p> <p>2.5 Confirm selections are consistent with brief and client requirements</p>                                                                                                                    |
| 3. Determine shader attributes and assign to 3-D model  | <p>3.1 Identify and select <b>attributes</b> required to achieve desired effects on 3-D models</p> <p>3.2 Determine and confirm requirements related to lighting and rendering</p> <p>3.3 Use appropriate methods and techniques to achieve a desired shading outcome</p>                                                                                                                                                                                                                                                         |
| 4. Acquire new textures                                 | <p>4.1 Identify desired <b>resolution</b> for texture prior to acquisition</p> <p>4.2 Acquire textures from an online library</p> <p>4.3 <b>Capture real-world textures</b> using digital means</p> <p>4.4 Generate texture using <b>art media</b> or digital paint software and save</p> <p>4.5 Ensure resolution of acquired texture meets resolution requirements</p>                                                                                                                                                          |
| 5. Generate procedural textures and create texture map  | <p>5.1 Assess nature of surface topology</p> <p>5.2 Identify suitable types of 3-D projection</p> <p>5.3 Apply geometry where necessary</p> <p>5.4 Use algorithms to simulate natural patterns where required</p>                                                                                                                                                                                                                                                                                                                 |

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|                           | <p>5.5 Determine <i>texture-mapping method</i></p> <p>5.6 Determine <i>projection-mapping method</i></p> <p>5.7 Adjust parameters to achieve desired effects</p>                                                                                                                                                                                |
| 6. Apply texture to model | <p>6.1 Apply texture to model</p> <p>6.2 Layer and enhance textures to achieve desired effects</p> <p>6.3 Apply lighting to test reaction of textures</p> <p>6.4 Apply textures to lights to achieve specified effects</p> <p>6.5 Adjust textures to achieve final effects</p> <p>6.6 Complete test renders and confirm outcome with client</p> |
| 7. Finalise design        | <p>7.1 Present test renders to client for approval</p> <p>7.2 Make technical or design adjustments consistent with feedback and budgetary constraints</p> <p>7.3 Finalise shading and texturing</p> <p>7.4 Save and archive files in agreed formats and repository</p>                                                                          |

## Required Skills and Knowledge

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

### Required skills

- analytical skills to evaluate technical requirements of shading and texturing against resources and timeframes
- communication skills to liaise with project team and clients
- initiative and enterprise skills to:
  - devise efficient and innovative approaches to texturing and shading
  - provide practical support and give feedback to colleagues and management
- literacy skills to read technical documents and specifications
- planning and organisational skills to manage time and resources
- technical skills to use related computer graphics applications.

### Required knowledge

- camera textures and filters to achieve shading and texturing effects
- features of software used for:
  - 3-D modelling
  - appropriate file sizes and formats
  - digital image manipulation
  - lighting
  - rendering
  - scanning
  - scheduling of production activities
  - shading
  - texturing
- how to interpret design, texturing and shading briefs
- digital image capture using cameras and scanners
- shader attributes and their optimisation
- shader and texture mapping and projection
- texturing and shading requirements for games.

## 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.*

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| <b>Overview of assessment</b>                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b> | <p>Evidence of the ability to:</p> <ul style="list-style-type: none"> <li>• adhere to texturing and shading brief requirements</li> <li>• design and comprehend texturing tasks</li> <li>• use and optimise software components for best performance</li> <li>• adhere to system requirements related to file sizes and formats</li> <li>• store completed file components in an organised manner for further use.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Context of and specific resources for assessment</b>                                             | <p>Assessment must ensure access to:</p> <ul style="list-style-type: none"> <li>• computer hardware and software</li> <li>• input device, such as stylist tablet, keyboard and mouse</li> <li>• output device, such as monitor, TV, printer and speakers</li> <li>• models and scenes to be shaded and textured</li> <li>• style shots</li> <li>• rendering briefs or specifications and schedules</li> <li>• appropriate learning and assessment support when required</li> <li>• modified equipment for people with special needs.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Method of assessment</b>                                                                         | <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"> <li>• discussion or written report of the nominated techniques applied to shading and texturing</li> <li>• discussion with learner and observation of the integration of texturing activities into the overall production pipeline</li> <li>• verbal questioning regarding reasons for use of particular hardware and software options</li> <li>• direct observation of the candidate applying shaders and textures</li> <li>• project or work activities that show research and reference sourcing to gain best texturing effect</li> <li>• written and verbal reports or documentation showing research and production plan</li> <li>• review of portfolios of evidence</li> <li>• review of completed textured, shaded and rendered models.</li> </ul> |

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| <b>Guidance information for assessment</b> | <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 with targeted questioning to assess required knowledge.</p> |
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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.*

|                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| <b><i>The brief</i></b> may include:                        | <ul style="list-style-type: none"> <li>• illustrations</li> <li>• storyboards</li> <li>• technical specifications</li> <li>• verbal or written instructions.</li> </ul>                                                                                                                                                                                                                                                                                    |
| <b><i>Client</i></b> may include:                           | <ul style="list-style-type: none"> <li>• 3-D artists</li> <li>• animators</li> <li>• art directors</li> <li>• designers</li> <li>• external clients</li> <li>• modellers</li> <li>• technical directors.</li> </ul>                                                                                                                                                                                                                                        |
| <b><i>Design and technical constraints</i></b> may include: | <ul style="list-style-type: none"> <li>• budget</li> <li>• design specifications</li> <li>• file formats for output and end use</li> <li>• technical requirements.</li> </ul>                                                                                                                                                                                                                                                                              |
| <b><i>Software</i></b> may include:                         | <ul style="list-style-type: none"> <li>• 3-D Studio Max</li> <li>• Animator Pro</li> <li>• AutoCAD</li> <li>• AutoCAD Revit 9</li> <li>• Blender</li> <li>• Bodypaint</li> <li>• Cinema 4D</li> <li>• Combustion</li> <li>• CorelDraw</li> <li>• Deep paint</li> <li>• Electric Image</li> <li>• Form Z</li> <li>• Houdini</li> <li>• Illustrator</li> <li>• Lightwave</li> <li>• Maya</li> <li>• Photoshop</li> <li>• Pixie</li> <li>• POV-Ray</li> </ul> |

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|                                                 | <ul style="list-style-type: none"> <li>• Renderman</li> <li>• Rhino</li> <li>• Shake</li> <li>• Soft Image or XSI</li> <li>• Z Brush.</li> </ul>                                                                                                         |
| <b>Shaders</b> may include:                     | <ul style="list-style-type: none"> <li>• Blinn</li> <li>• cell shaders</li> <li>• Lambert</li> <li>• Phong</li> <li>• realistic shaders</li> <li>• toon shaders.</li> </ul>                                                                              |
| <b>Textures</b> may include:                    | <ul style="list-style-type: none"> <li>• brick</li> <li>• cloth</li> <li>• glass</li> <li>• latex</li> <li>• leather</li> <li>• metal</li> <li>• skin</li> <li>• sky</li> <li>• stone</li> <li>• textiles</li> <li>• wood.</li> </ul>                    |
| <b>Attributes</b> may include:                  | <ul style="list-style-type: none"> <li>• ambient colour</li> <li>• colour</li> <li>• diffusion</li> <li>• incandescence</li> <li>• reflectivity</li> <li>• refraction</li> <li>• specularity</li> <li>• translucence</li> <li>• transparency.</li> </ul> |
| <b>Resolution</b> may include:                  | <ul style="list-style-type: none"> <li>• 1024 x 1024 pixels</li> <li>• 128 x 128 pixels</li> <li>• 720 x 720 pixels.</li> </ul>                                                                                                                          |
| <b>Capture real-world textures</b> may include: | <ul style="list-style-type: none"> <li>• digital photography</li> <li>• film photography</li> <li>• scanning.</li> </ul>                                                                                                                                 |
| <b>Art media</b> may include:                   | <ul style="list-style-type: none"> <li>• acrylic paint</li> <li>• airbrush</li> <li>• charcoal</li> <li>• crayon</li> </ul>                                                                                                                              |

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|                                                      | <ul style="list-style-type: none"><li>• gouache</li><li>• ink</li><li>• ink wash</li><li>• oil paint</li><li>• pen</li><li>• pencil</li><li>• tusche</li><li>• watercolour.</li></ul>              |
| <b><i>Texture-mapping method</i></b> may include:    | <ul style="list-style-type: none"><li>• bump maps</li><li>• colour mapping</li><li>• displacement maps</li><li>• reflection maps</li><li>• specular mapping</li><li>• transparency maps.</li></ul> |
| <b><i>Projection-mapping method</i></b> may include: | <ul style="list-style-type: none"><li>• cubic</li><li>• cylindrical</li><li>• planar</li><li>• spherical</li><li>• tiling.</li></ul>                                                               |

## Unit Sector(s)

Game development