|  |  |
| --- | --- |
| Title | **Customise rendering, materials and lights** |
| Level | **3** | **Credits** | **16** |

|  |  |
| --- | --- |
| Purpose | The competency standard is designed to learn the application of Rendering, its environment and background, and advance features. Use of different Materials and Lights are highlighted for 3D drawings. |

|  |  |
| --- | --- |
| Classification ISCED | 0611 Computer use |

|  |  |
| --- | --- |
| Available grade | Competent / Not yet competent |

|  |  |
| --- | --- |
| Modification history | N/A |

|  |  |  |
| --- | --- | --- |
| **Competency Unit** | **Performance Criteria** | **Knowledge and Understanding** |
| **K1: Execute Rendering** | **The trainee will be able to:****P1.** Create a photorealistic or realistically shaded image of a three- dimensional wireframe or solid model using “Render” commands:* Destination
* Quality
* Selection
* Crop
* File.

**P2.** Determine the output site that the renderer uses to display the rendered image using “RPERF” command and selecting “Destination”.**P3.** Determine the output quality that the renderer uses to display the rendered image using “RPERF” command and selecting “Quality level”.**P4.** Controls the parts of the model that gets processed during rendering for following three settings;* View
* Crop
* Selected
 | **The trainee will be able to: K1.** Explain Render command**K2.** Recognize environmental features. |

|  |  |  |
| --- | --- | --- |
|  | **P5.** Render Cropped window using “RPERF” command and selecting “Procedure”.**P6.** Execute the process to Render to File and Turn off Render to File.**P7.** Use environmental features (Render, Gradient) and background (Solid, Image) to set up atmospheric effects or background images using “RENDERENVIRONMENT” command.**P8.** Apply following Backgrounds:* Single color
* Multi-color gradient
* Bitmap image

using “View” command and later selecting “New”.**P9.** Define settings that affect how materials are handled by the renderer as:* Apply Materials
* Texture Filtering
* Force 2-Sided

**P10.** Execute how renderer control sampling by allocating values to:* Min Samples
* Max Samples
* Filter Type
* Filter Width and Filter Height
* Contrast color
* Contrast Alpha
 | **K3.** Explain advance features of Rendering as Sampling, Shadow, Ray Tracing, Illumination, Diagnostic processing.**K4.** Define how effects illuminate scene |
|  | **P11. Apply settings that affect how shadows appear in the rendered image in Simple, Sort, or Segments modes.****P12. Experiment advance features of Rendering as:*** **Sampling**
* **Shadow**
* **Ray Tracing**
* **Illumination**
* **Diagnostic processing**

**P13. Apply settings that affect the shading of a rendered image (Ray tracing) with following options:*** **Enable**
* **Max Depth**
* **Max Reflection**
* **Max Refraction**

**P14. Configure the affects that illuminate scene with following option:*** + **Enable**
	+ **Radius**
	+ **Max Depth**
	+ **Max Reflection**
	+ **Max Refraction**

**P14. Associate with “Diagnostic” and “Processing” features.** | K5. Explain “Diagnostic” and “Processing” features. |
| K2: Apply/Configure materials | **The trainee will be able to:** | The trainee will be able to: |

|  |  |  |
| --- | --- | --- |
|  | **P1.** Add Material to drawing using “Materials” or “Marbrowseropen” commands.**P2.** Apply Material layers using “MATERIALATTACH” command.**P3.** Create own Material e.g. photo, Shapes.**P4.** Achieve Material mapping of photo or shapes using “MATERIALMAP” command.**P5.** Configure “Cutout Materials” procedure.**P6.** Apply “Bump Map” option of the Material command.**P7.** Execute “\_VSMATERIALMODE” command to On/Off Materials. | **K1.** Explore different methods to add/edit Materials to 3D drawings.**K2.** Define how to adjust Material scale/layer.**K3.** Understand the Material mapping (Photo, Shapes).**K4.** Explain how to purge Materials from objects. |
| **K3: Apply Lights** | **The trainee will be able to:****P1.** Turn On/Off the default Lighting using “DEFAULTLIGHTING” command.**P2.** Execute command “POINTLIGHT” that radiates light in all directions from its location.**P3.** Execute command “SPOTLIGHT” that emits a directional cone of light.**P4.** Modify Lights in a drawing using “LIGHTLIST” command.**P5.** Customize Photometric:* Light energy
 | **The trainee will be able to:****K1.** Categorise point and spot Lights.**K2.** Understand Lights tool palette. |

|  |  |  |
| --- | --- | --- |
|  | * Light for lighting units
* Luminaries
* Weblight
* Halogen effect
* Candela intensity, etc.

**P6.** Apply the available functionality of Lights tool palette by pressing CTRL+3. SUNPROPERTIES’ command.**P7.** Display uniform parallel light rays in one direction only using “DISTANTLIGHT” command and mentioning from and to points.**P8.** Incorporate natural light based on climate into the drawing by specifying the latitude and longitude of a location for the sunlight using “GEOGRAPHICLOCATION” command.**P9.** Adjust the Sun properties using the “SUNPROPERTIES” command | **K3.** Describe geographic location settings for a particular object.**K4.** Observe how to handle the Sun properties for Light issues. |