



Australian Government

CPPSIS6040 Develop 2-D and 3-D terrain visualisations

Release: 1

CPPSIS6040 Develop 2-D and 3-D terrain visualisations

Modification History

Release 1.

Replaces superseded equivalent CPPSIS6040A Develop 2-D and 3-D terrain visualisations.

This version first released with CPP Property Services Training Package Version 3.

Application

This unit of competency specifies the outcomes required to develop two-dimensional (2-D) and three-dimensional (3-D) visualisations in a geographic information system (GIS) or computer-aided design (CAD) context. It requires the ability to apply wide-ranging specialised technical, creative and conceptual skills and a broad knowledge of spatial datasets. The unit requires the development of technical documentation incorporating mapping and scientific techniques, as well as the ability to communicate graphically. It also requires an understanding of the latest technologies that are available to remotely capture raw elevation data.

The unit supports those who work in a technical management role in a spatial information services team in areas such as cartography, town planning, mapping and GIS.

No licensing, legislative, regulatory, or certification requirements apply to this unit of competency at the time of endorsement.

Pre-requisite Unit

Nil

Unit Sector

Surveying and spatial information services

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the range of conditions.				
1. Prepare 2-D or 3-D digital elevation model (DEM).	<table><tr><td>1.1.</td><td>GIS or CAD environment or surface elevation is designed according to project specifications and organisational requirements.</td></tr><tr><td>1.2.</td><td>Current remote sensing technologies for capturing raw elevation data are investigated.</td></tr></table>	1.1.	GIS or CAD environment or surface elevation is designed according to project specifications and organisational requirements.	1.2.	Current remote sensing technologies for capturing raw elevation data are investigated.
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- 1.3. Views and layouts are established according to job specifications.
 - 1.4. Spatial computing platforms and software systems are selected and set up for suitability against job specifications according to organisational requirements.
2. Create 2-D drawings.
 - 2.1. Availability of suitable data is verified with potential suppliers and constraints are assessed according to job specifications.
 - 2.2. Detailed views and layouts are created using various scales according to job specifications.
 - 2.3. 2-D drawings are finalised and existing 2-D model is modified as necessary to meet job specifications.
3. Create 3-D model or DEM.
 - 3.1. Surface elevation is modelled by mathematically defined surfaces and by point or line data according to job specifications.
 - 3.2. Products that can be derived from a DEM are determined according to job specifications.
 - 3.3. Entities are created and manipulated in 3-D space according to job specifications.
 - 3.4. DEM is developed with a range of thematic data and profiles generated and draped over model according to project specifications.
 - 3.5. Contour map of area is created by employing procedures appropriate to data format and software according to job specifications.
 - 3.6. Slope map of area is created from gradient and aspect components according to job specifications.
 - 3.7. Shaded relief map of area is created from gradient and relief map representations according to job specifications.
 - 3.8. 3-D model is finalised and existing 3-D model modified as necessary to meet job specifications.

4. Produce output.
- 4.1. 2-D and 3-D outputs are documented according to project specifications and organisational requirements.
 - 4.2. Drawing files and elevation data outputs are saved in appropriate format according to job specifications and organisational requirements.
 - 4.3. Physical properties are extracted to job specifications and slope map of area is used for analytical purposes.

Foundation Skills

This section describes the language, literacy, numeracy and employment skills essential to performance in this unit but not explicit in the performance criteria.

Skill	Performance feature
Initiative and enterprise skills to:	• extract and output information from engineering and environmental plans • translate specifications into drawing and analysis design • understand how raw elevation data is captured and assigned quality measures.
Numeracy skills to:	• apply quality and accuracy measures on modelled 2-D and 3-D outputs • apply understanding of height, depth, breadth, dimension and position to actual operational activity and virtual representation • use appropriate interpolation techniques to convert from point to raster data.
Oral communication skills to:	• liaise with clients and end users to identify project requirements and drawing detail.
Reading skills to:	• interpret graphical information, including rasters • interpret technical drawing standards • interpret engineering and environmental plans.

Technology skills to:

- conduct web-based searches and use digital techniques
- operate hardware, including computers and plotters.

Unit Mapping Information

CPPSIS6040A Develop 2-D and 3-D terrain visualisations

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=6f3f9672-30e8-4835-b348-205dfcf13d9b>

Assessment Requirements for CPPSIS6040 Develop 2-D and 3-D terrain visualisations

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Performance Evidence

A person demonstrating competency in this unit must satisfy the requirements of the elements, performance criteria and foundation skills of this unit. The person must also use a geographic information system (GIS) or computer-aided design (CAD) environment to develop two-dimensional (2-D) and three-dimensional (3-D) terrain visualisations that meet specifications for two different projects.

While developing the above 2-D and 3-D terrain visualisations, the person must:

- analyse and define job specifications, constraints and main work activities
- conduct web-based searches to identify available spatial data and verify its suitability to meet drawing specifications
- prepare the CAD environment by setting up the hardware and software system and drawing defaults and customising menus
- design the surface elevation, orientation and views to meet job specifications
- exercise precision and accuracy in relation to terrain visualisations
- select and use spatial computing platforms and software systems to prepare drawings and models that meet specifications relating to:
 - accuracy
 - completeness
 - coverage
 - density
 - logical consistency
- use appropriate interpolation techniques to convert from vector to raster data
- communicate clearly with clients and colleagues to clarify design requirements and detail
- comply with standard operating procedures, drawing standards and organisational requirements relating to:
 - completing records and reporting
 - quality and risk management
 - working safely when using the equipment specified in the assessment conditions
- create and manipulate entities in 3-D space to develop contour, slope and shaded relief maps of an area
- create detailed 2-D views using various scales

- create a digital elevation model in 3-D using mathematically defined surfaces and point or line data
- identify and assess constraints and problems relating to spatial data
- save drawing files in a range of formats.

Knowledge Evidence

A person demonstrating competency in this unit must demonstrate knowledge of:

- computer platforms and software for GIS, CAD and digital elevation models (DEM)
- copyright and ownership constraints relating to spatial data
- data formats and precision and accuracy requirements for preparing terrain visualisations in 2-D drawings and 3-D models
- digital image processing techniques
- display principles, including:
 - colour
 - composition
 - font type
 - legends
 - media
 - scale
 - size
 - text and line style
- existing spatial datasets and dataset sources
- GIS and CAD principles, capabilities and uses in relation to creating terrain visualisations
- methods for validating spatial data sources and constraints on use
- organisational requirements relating to records and reporting
- remote sensing technologies that capture raw elevation data
- key features of spatial referencing systems
- techniques for modifying existing 2-D and 3-D models
- types of products that can be derived from a DEM.

Assessment Conditions

The following must be present and available to learners during assessment activities:

- equipment:
 - personal computer, including GIS or CAD applications and software appropriate for developing 2-D and 3-D terrain visualisations
 - hardware, including printer, scanner, plotter and multimedia devices and peripherals
- specifications:
 - project and design specifications
 - organisational policies, procedures and documentation relating to:
 - quality measures relating to 2-D and 3-D terrain visualisations

- data privacy and information copyright
- physical conditions:
 - access to equipped work station
- relationships with team members and supervisor:
 - lead role in a team
- relationships with client:
 - client consultation required.

Timeframe:

- as specified by the client and project requirements.

Assessor requirements

As a minimum, assessors must satisfy the assessor requirements in the Standards for Registered Training Organisations (RTOs) current at the time of assessment.

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