



Australian Government

Department of Education, Employment and Workplace Relations

ICAPRG415A Apply skills in object-oriented design

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 apply the cyclic process of iteration from identification of class, instance, role and type to the final complete object-oriented model of the application.

Application of the Unit

This unit applies to system designers who are required to design systems in an object-oriented method.

Object-oriented languages are an important feature of software development processes world-wide.

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. Derive the high-level design from specification	<p>1.1 Develop a static class diagram from a given set of <i>specifications</i></p> <p>1.2 Develop either a collaboration diagram or a sequence diagram from a given set of specifications</p> <p>1.3 Develop either an activity diagram or a state diagram from a given set of specifications</p>
2. Refine the design	<p>2.1 Investigate and refine behaviour, state of classes and the collaboration between classes</p> <p>2.2 Validate the correct visibility of class services and state data</p> <p>2.3 Identify generalisations within classes</p> <p>2.4 Identify specialisations within classes</p> <p>2.5 Apply the principles of aggregation and composition to refine class design</p>
3. Document the design	<p>3.1 Create detailed uniform modelling language (UML) static class diagrams</p> <p>3.2 Create detailed UML collaboration or sequence diagrams</p> <p>3.3 Create detailed UML activity or state diagrams</p>

Required Skills and Knowledge

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

Required skills

- communication skills to liaise with clients and staff
- technical skills to:
 - abstract classes related to producing the required design
 - conduct completion of abstractions to successfully produce the required design
 - conduct domain analysis to successfully produce the required design
 - conduct refinement of inheritance hierarchies to successfully produce the required design.

Required knowledge

- design quality metrics, such as coupling and cohesion
- design refinement techniques
- programming design principles
- different programming methodologies
- various developmental life cycle options.

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"> • produce an object-oriented design from requirements documents or system specifications, including: <ul style="list-style-type: none"> • static class diagrams • collaboration or sequence diagrams • activity or state diagrams.
Context of and specific resources for assessment	<p>Assessment must ensure access to:</p> <ul style="list-style-type: none"> • system specifications • requirement documents • design specifications • detailed design • 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 candidate performing the process of iteration from identification of class, instance, role and type to the object-oriented model • verbal or written questioning to assess candidate's knowledge of object-oriented techniques and analytical skills, including evaluating development methodologies to a project or scenario to the scope and tasks involved in the object-oriented design processes • review of documentation as required by the chosen methodology.
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</p>

	<p>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.

<p><i>Specifications</i> may include:</p>	<ul style="list-style-type: none"> • specifications of a system or process application that includes use-case diagrams • requirements document.
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Unit Sector(s)

Programming and software development