



Australian Government

Department of Education, Employment and Workplace Relations

ICAA4058B Apply skills in object-oriented design

Release: 1

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Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit defines the competency 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. The following unit is linked and forms an appropriate cluster: • ICAA4233B Determine and apply appropriate development methodologies No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
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Application of the Unit

Application of the unit	
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	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.
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Elements and Performance Criteria

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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Domain analysis in relation to successfully producing the required design
- Completion of abstractions in relation to successfully producing the required design
- Refinement of inheritance hierarchies in relation to successfully producing the required design
- Class naming in relation to successfully producing the required design
- Abstract classes in relation to successfully producing the required design

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

- Design refinement techniques
- Implementation of design principles
- Various life cycle options
- Methodological philosophy
- Design quality metrics (e.g. coupling and cohesion)

Evidence Guide

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

Evidence of the following is essential:

- Assessment must confirm sufficient knowledge of object-oriented techniques and analysis skills.
- Assessment must confirm the ability to meet technical requirements by successfully producing the required design.

To demonstrate competency in this unit the learner will need access to:

- Design specifications
- Detailed design

Context of and specific resources for assessment

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

Evaluating development methodologies to a project or scenario clarifies the scope and tasks involved in a object-oriented design processes.

The stages of the development methodology should be followed within the scope of a project or scenario, and the relevant supporting documentation produced.

The breadth, depth and complexity of knowledge and skills in this competency would cover a broad range of varied activities or application in a wider variety of contexts most of which are complex and non-routine. Leadership and guidance would be involved when organising activities of self and others as well as contributing to technical solutions of a non-routine or contingency nature.

Assessment must ensure:

EVIDENCE GUIDE	
	• Performance of a broad range of skilled applications including the requirement to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills would be characteristic. • Applications may involve responsibility for, and limited organisation of, others.
Method of assessment	The purpose of this unit is to define the standard of performance to be achieved in the workplace. In undertaking training and assessment activities related to this unit, consideration should be given to the implementation of appropriate diversity and accessibility practices in order to accommodate people who may have special needs. Additional guidance on these and related matters is provided in ICA05 Section 1. The following assessment method is appropriate for this unit: • Competency in this unit should be assessed using summative assessment to ensure consistency of performance in a range of contexts. This unit can be assessed either in the workplace or in a simulated environment. However, simulated activities must closely reflect the workplace to enable full demonstration of competency. • Assessment will usually include observation of real or simulated work processes and procedures and/or performance in a project context as well as questioning on underpinning knowledge and skills. The questioning of team members, supervisors, subordinates, peers and clients where appropriate may provide valuable input to the assessment process. The interdependence of units for assessment purposes may vary with the particular project or scenario.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICAA4233B Determine and apply appropriate

EVIDENCE GUIDE

	development methodologies An individual demonstrating this competency would be able to: • Understand a range of development object-oriented methodologies and their application • Demonstrate theoretical knowledge of object-oriented language development • Apply a methodology to a project or scenario • Produce documentation required by the chosen methodology • An individual demonstrating this competency would be able to: • Demonstrate understanding of a broad knowledge base incorporating some theoretical concepts • Apply solutions to a defined range of unpredictable problems • Identify and apply skill and knowledge areas to a wide variety of contexts, with depth in some areas • Identify, analyse and evaluate information from a variety of sources • Take responsibility for own outputs in relation to specified quality standards • Take limited responsibility for the quantity and quality of the output of others • Maintain knowledge of industry products and services
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Range Statement**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.

Specifications

- High-level specifications of a system or process application that includes use-case

RANGE STATEMENT	
	diagrams
<i>UML</i>	Uniform Modelling Language according to the ISO standard or an appropriate super set

Unit Sector(s)

Unit sector	Analyse and Design
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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