



Australian Government

Department of Education, Employment and Workplace Relations

ICAPRG406A Apply introductory object-oriented language skills

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 undertake introductory programming tasks using an object-oriented programming language. Competency includes tool usage, documentation, debugging and testing techniques in support of the programming activities.

Application of the Unit

This unit applies to programmers in a variety of fields who are required to produce simple programs in object-oriented languages.

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. Apply basic language syntax and layout	<p>1.1 Demonstrate understanding and application of basic <i>language</i> syntax rules and best practices</p> <p>1.2 Select and use language data types, operators and expressions to create clear and concise code</p> <p>1.3 Use the appropriate language syntax for sequence, selection and iteration constructs</p> <p>1.4 Use a modular programming approach within member or function logic</p> <p>1.5 Apply arrays, including arrays of objects to introductory programming tasks</p> <p>1.6 Use <i>standard-array processing algorithms</i></p> <p>1.7 Use the facilities of the language to read and write data from and to text files and record outcomes</p>
2. Apply basic object-oriented principles in the target language	<p>2.1 Implement a class that contains primitive member or instance variables</p> <p>2.2 Implement a class that contains multiple options for object construction</p> <p>2.3 Implement a class that uses user-defined aggregation (object instance or member variables)</p> <p>2.4 Use the facilities provided in the language to implement inheritance to at least two levels of depth</p> <p>2.5 Use polymorphism at a simple level through inheritance to enable easy extension of code</p>
3. Debug code	<p>3.1 Use an <i>integrated development environment</i>, in particular the language debugging facilities, to debug code</p> <p>3.2 Interpret compiler or interpreter messages to resolve syntax errors and use debugging techniques to resolve logic errors</p>
4. Document activities	<p>4.1 Follow organisational guidelines for developing maintainable code and adhere to the provided <i>coding standards</i> when documenting activities</p> <p>4.2 Apply internal documentation to all code created and use documentation tools available in the target language when documenting activities</p>
5. Test code	<p>5.1 Create and conduct simple tests to confirm code meets <i>design specification</i></p> <p>5.2 Document the tests performed and results achieved</p>

6. Create an application	6.1 Develop a solution when provided with a basic <i>object-oriented design document</i> 6.2 Refer to appropriate documentation for the language
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Required Skills and Knowledge

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

Required skills

- analytical skills to translate requirements from problem space to machine space
- communication skills to liaise with client
- literacy skills to:
 - document results
 - read and interpret program specifications
- problem-solving skills to debug problems with program code
- technical skills to:
 - debug and test
 - use integrated development environment
 - use internal (code) documentation
 - use programs.

Required knowledge

- processes and techniques related to the use of:
 - object-oriented programming concepts and language
 - small-size application development
 - graphical user interface (GUI) to interact with operator.

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"> • use an application program to design and build standard reusable software modules in response to a design specification • generate code documentation • undertake testing to confirm that the created application meets the original specification and solves original problem.
Context of and specific resources for assessment	<p>Assessment must ensure access to:</p> <ul style="list-style-type: none"> • software development environment • technical requirements • 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"> • verbal or written questioning to assess candidate's knowledge of processes and techniques related to object-oriented programming concepts and language • evaluation of object-oriented solution • review of developed program documentation.
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 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>

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.

<i>Language</i> may include:	<ul style="list-style-type: none"> • C#.net • C++ • Java • Small Talk • VB.NET.
<i>Standard-array processing algorithms</i> may include:	<ul style="list-style-type: none"> • insertion and deletion algorithms • search.
<i>Integrated development environment</i> may include:	<ul style="list-style-type: none"> • Code Warrior • Eclipse • JBuilder • J-Edit • Visual C++ • Visual Studio suite.
<i>Coding standards</i> may include:	<ul style="list-style-type: none"> • GNU • Java.
<i>Design specification</i> may include:	<ul style="list-style-type: none"> • current system functionality • technical requirements • user problem statement.
<i>Object-oriented design document</i> may include:	<ul style="list-style-type: none"> • class diagrams • supplementary specifications • use-cases.

Unit Sector(s)

Programming and software development