Australian Government

Department of Education, Employment and Workplace Relations

ICAB5226B Apply advanced object-oriented language skills

Release: 1

ICAB5226B Apply advanced object-oriented language skills

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit defines the competency required to undertake advanced programming tasks using an object-oriented programming language. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		
	ICAB5223B	Apply intermediate object-oriented language skills

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Employability Skills Information

Employability skills	This unit contains employability skills.

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. Develop client/server application	1.1. Build and test simple client server applications 1.2. Make use of the features of the language that enable inter-process communication through at least one ***mechanism*** 1.3. Make use of the features of the language that enable remote procedure calls (RPC) using a class that is based on multiple inheritances 1.4. Build programs using classes that are based on nested classes
2. Develop GUI	2.1. Use the facilities within the target language to implement advanced GUI features, including but not limited to drag and drop, help files and 2D graphics
3. Build webenabled applications	3.1. Code within an existing ***architectural framework*** 3.2. Implement ***server side code*** to run a simple web-enabled application that includes data transfer between client and server and is standard for the object-oriented target language 3.3. Implement the necessary ***client side code*** to run a simple web-enabled application that includes data transfer between client and server and is standard for the object-oriented target language 3.4. Describe the concept of design patterns that the architectural framework uses
4. Debug code	4.1. Use standalone debugging tools or tools provided by ***integrated development environment*** to examine running code 4.2. Detect logical and coding errors using debugger 4.3. Use tracing of code and examination of variable contents during execution to detect and correct errors
5. Test application	5.1. Design and document tests to be undertaken 5.2. Undertake limited testing of produced code to ensure program specification is complied with 5.3. Document test results
6. Document system	6.1. Demonstrate adherence to guidelines for developing maintainable code and company or institutional ***coding standards*** 6.2. Read and interpret supplied design documents to create code 6.3. Create and maintain program documentation

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ELEMENT	PERFORMANCE CRITERIA
	6.4. Ensure that user documentation in the form of on-line help is built into applications

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• Reading and interpreting design specifications, translating requirements from problem space to machine space • Writing a GUI to effectively interacts with operator • Web-enabled application development • Client-server application development • Integrated development environment usage • Programming techniques • Internal (code) documentation techniques • Debugging techniques • Documentation techniques
Required knowledge
• Architecture of a framework for web-enabled application development • Inter-process communication • Large size application development • Use of third-party supplied code • Testing techniques as applied to distributed application development • Documentation techniques

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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 that application programs are designed and built from a provided problem scenario and set of specifications. • Design and code documentation must be generated. Testing must confirm that created application meets original specification and solves original problem. • Evidence for this competency includes tool usage, documentation, debugging and testing techniques in support of the programming activities. To demonstrate competency in this unit the person will require access to: • Software development environment • Access to web server • Technical requirements
Context of and specific resources for assessment	Programming in object-oriented languages is a software development methodology that offers the programmer standard reusable software modules (components), rather than requiring the developer to write custom programming code each time. Using standard components reduces development time (because the writing and testing of those components has already been done by other programmers), and ensures a standard look and feel for programs using the same components. Object-oriented languages are an important feature of software development processes world-wide. The breadth, depth and complexity covering planning and initiation of alternative approaches to skills or knowledge applications across a broad range of technical and/or management requirements, evaluation and coordination would be characteristic.

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EVIDENCE GUIDE	
	Assessment must ensure: • The demonstration of competency may also require self-directed application of knowledge and skills, with substantial depth in some areas where judgement is required in planning and selecting appropriate equipment, services and techniques for self and others. • Applications involve participation in development of strategic initiatives as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team coordination may also be involved.
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. • 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 must confirm competency in all areas of the software development cycle. • 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

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EVIDENCE GUIDE	
	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. An individual demonstrating this competency would be able to: • Demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas • Analyse and plan approaches to technical problems or management requirements • Transfer and apply theoretical concepts and/or technical or creative skills to a range of situations • Evaluate information, using it to forecast for planning or research purposes • Take responsibility for own outputs in relation to broad quantity and quality parameters • Take some responsibility for the achievement of group outcomes • Maintain knowledge of industry products and services

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.	
Integrated development environment may include but is not limited to:	• Visual C++ • Visual Studio suite • WebSphere • Eclipse

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RANGE STATEMENT	
	• J-Edit • Code Warrior • JBuilder
Mechanism may include but is not limited to:	• sockets • pipes
Server side code may include:	• ASP • servlets • JSP • PHP etc.
Client side code	• Web Forms, Applets, Javascript etc.
Architectural framework may include:	• J2EE • NET
Coding standards may include:	• Java coding standard • GNU coding standard

Unit Sector(s)

Unit sector	Build

Co-requisite units

Co-requisite units		

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Competency field

Competency field	

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