



**Australian Government**

# **ICTPRG302 Apply introductory programming techniques**

**Release: 1**

# ICTPRG302 Apply introductory programming techniques

## Modification History

| Release   | Comments                                                                                                     |
|-----------|--------------------------------------------------------------------------------------------------------------|
| Release 1 | This version first released with ICT Information and Communications Technology Training Package Version 6.0. |

## Application

This unit describes the skills and knowledge required to create simple applications through introductory programming techniques.

It applies to those who have responsibility for creating applications and includes applying language syntax, control structures to create code, using programming standards, testing and debugging.

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

## Unit Sector

Programming and software development

## Elements and Performance Criteria

| ELEMENT                                          | PERFORMANCE CRITERIA                                                                                                                                                                                                                                    |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i> | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                  |
| 1. Establish application task                    | 1.1 Clarify task with required personnel<br>1.2 Identify design specifications, programming standards and guidelines according to task requirements                                                                                                     |
| 2. Apply language syntax and layout              | 2.1 Apply basic language syntax rules<br>2.2 Create code using language data types, operators and expressions<br>2.3 Apply variables and variable scope<br>2.4 Use program library functions<br>2.5 Clarify meaning of code using commenting techniques |
| 3. Apply control structures                      | 3.1 Apply language syntax in sequence, selection and iteration constructs                                                                                                                                                                               |

| ELEMENT                                          | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                              |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | 3.2 Create expressions in selection and iteration constructs using logical operators                                                                                                                                                                                                              |
| 4. Code using standard programming algorithms    | 4.1 Develop algorithms using sequence, selection and iteration constructs<br>4.2 Create and use data structures<br>4.3 Code standard sequential access algorithms used in reading and writing text files<br>4.4 Apply string manipulation                                                         |
| 5. Test code                                     | 5.1 Examine variable contents and use debugging techniques to detect and correct errors<br>5.2 Create and conduct simple tests and confirm code meets design specification<br>5.3 Document actions carried out and results of tests performed                                                     |
| 6. Create a simple application and seek feedback | 6.1 Design an algorithm in response to basic program specifications<br>6.2 Develop application to meet program specification<br>6.3 Confirm application meets initial specifications<br>6.4 Present application to required personnel<br>6.5 Obtain feedback and sign off from required personnel |

## Foundation Skills

*This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.*

| SKILL                   | DESCRIPTION                                                                                                                                                                                                                                                                        |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oral Communication      | <ul style="list-style-type: none"><li>• Uses listening and questioning techniques to confirm requirements and articulate complex concepts</li></ul>                                                                                                                                |
| Numeracy                | <ul style="list-style-type: none"><li>• Confirms program specifications are met using mathematical formulae</li></ul>                                                                                                                                                              |
| Writing                 | <ul style="list-style-type: none"><li>• Writes and edits code and technical data in a logical manner using required syntax</li><li>• Develops documentation outlining changes and tests performed using appropriate structure, layout and technical programming language</li></ul> |
| Planning and organising | <ul style="list-style-type: none"><li>• Takes responsibility for planning, sequencing and prioritising tasks and own workload</li></ul>                                                                                                                                            |

| SKILL           | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Problem solving | <ul style="list-style-type: none"><li>Analyses required outcomes and determines program code using problem-solving techniques</li><li>Uses a formal decision-making process, identifying and evaluating several choices against a limited set of criteria when selecting syntax</li><li>Evaluates decisions in terms of how well they meet stated design specifications</li></ul> |
| Technology      | <ul style="list-style-type: none"><li>Completes complex tasks using features of digital tools</li></ul>                                                                                                                                                                                                                                                                           |

## Unit Mapping Information

Supersedes and is equivalent to ICTPRG301 Apply introductory programming techniques.

## Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

# Assessment Requirements for ICTPRG302 Apply introductory programming techniques

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## Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- design and build one simple application according to programming standards and program specifications.

In the course of the above, the candidate must:

- apply programming language syntax, sequence, selection and iteration constructs
- document changes and tests performed
- review code according to feedback obtained during design and development of application.

## Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- language data types, operators, expressions and variables
- basic language syntax rules
- sequence, selection and iteration constructs
- the development of small-sized applications
- industry programming standards and guidelines
- commenting techniques
- debugging techniques
- application testing methods
- basic data structures.

## Assessment Conditions

Skills in this unit must be demonstrated in a workplace or simulated environment where the conditions are typical of those in a working environment in this industry.

This includes access to:

- programming standards and guidelines
- programming software
- required hardware and its components
- industry standard software development tools
- an integrated development environment (IDE).

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

## Links

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