

APPLY STRUCTURED PROGRAMMING

ISCED UNIT CODE: 0613 451 06A

TVET CDACC CODE: ICT/OS/SD/CC/02/5/MA

UNIT DESCRIPTION

This unit covers the competencies required to apply structured programming. It involves applying computer programming basics, writing program code, implementing program logic and implementing modular programming.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace functions	These are assessable statements which specify the required level of performance for each of the elements <i>(Bold and italicized terms are elaborated in the range)</i>
1. Apply computer programming basics	1.1 Programming language types are identified according to the user requirements. 1.2 Programming paradigms are applied as per user requirements. 1.3 Program development life cycle is applied according to the work requirements. 1.4 Program design tools are applied as per the user requirements.
2. Write program Code	2.1 Program writing tools are identified according to the system requirements. 2.2 Identifiers are declared as per program design specification. 2.3 Initialization of variables and constants is performed according to program design specifications.
3. Implement Program logic	3.1 Data types are applied as per program specification 3.2 Data control structures in a program are applied as per program design requirements. 3.3 Data structures in a program are applied as per program design specifications.

4. Implement modular programming	4.1 Computer program subroutines are created as per user needs. 4.2 Data structures are applied in subroutines according to system requirements. 4.3 Computer program debugging is performed as per work procedures. 4.4 Computer program is compiled as per system requirements.
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RANGE

This section provides a work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
1. Programming paradigms may include but not limited to:	● Imperative ● Functional ● Procedural ● Object-oriented
2. Program design tools may include but not limited to:	● Flow charts ● Decision tables ● Decision trees ● Pseudocode ● Algorithm
3. Program writing tools may include but not limited to:	● Text editors ● Compilers Linkers ● Debuggers ● Special Integrated development Environment (IDE)
4. Identifier may include but not limited to:	● Names assigned to different entities such as variable, functions and arrays.
5. Data control structures include:	● Selection ● Loops ● Sequence
6. Data structures may include but not limited to:	● Arrays ● Queue ● Stack ● Linked lists

REQUIRED KNOWLEDGE AND SKILLS

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

Required knowledge

The individual needs to demonstrate knowledge of:

- Structured programming principles.
- Object oriented programming principles.
- Techniques of system analysis and design.
- Software development methodologies.
- Program development techniques.
- Software program testing and debugging techniques.

Required skills

The individual needs to demonstrate the following skills:

- Communications (verbal and written)
- Proficient in ICT
- Time management
- Problem solving
- Planning
- Decision making
- Report writing

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Applied program design tools as per the user requirements. 1.2 Created computer program input as per program design. 1.3 Data control structures in a program are applied as per program design requirements. 1.4 Applied data structures in a program as per program design specifications. 1.5 Created computer program subroutines as per user needs. 1.6 Coded computer program output as per user requirements. 1.7 Compiled computer program as per system requirements
2. Resource implications	The following resources should be provided: 2.1 Access to relevant workplace where assessment can take place. 2.2 Appropriately simulated environment where assessment can take place. 2.3 Resources relevant to the proposed activity or tasks.

3. Methods of assessment	Competency in this unit may be assessed through: 3.1 Observation 3.2 Portfolio of evidence 3.3 Interviews 3.4 Third party reports 3.5 Written assessment 3.6 Practical assessment 3.7 Projects
4. Context of assessment	Competency may be assessed: 4.1 On-the-job 4.2 In a simulated work environment
5. Guidance information for assessment	5.1 Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.