

## UNDERSTAND COMPUTER ORGANISATION AND ARCHITECTURE

**UNIT CODE:** ICT/OS/CS/CR/01/6/A

### UNIT DESCRIPTION

This unit covers the competencies required to understand Computer Organisation and Architecture. It involves understanding principles of computer organisation and design, understanding central processing unit functions, understanding computer memory functions, understanding input-output functions and understanding computer arithmetic and logic.

<b>ELEMENT</b> These describe the <b>key outcomes</b> which make up <b>workplace function</b> .	<b>PERFORMANCE CRITERIA</b> These are <b>assessable</b> 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. Understand principles of computer organization and design	1.1 Computer organisation is defined 1.2 Computer architecture is explained 1.3 Structure and function of computer components is explained 1.4 Hardware components of a computer are identified
2. Understand central processing unit functions	2.1 The Central Processing Unit is explained. 2.2 CPU architecture is explained 2.3 Role of registers is explained 2.4 Instruction representation and execution is explained 2.5 <b>CPU specifications</b> are prescribed for a user 2.6 CPU specifications are verified for a given computer
3. Understand computer memory functions	3.1 Memory organization is explained. 3.2 Various <b>storage technologies</b> are explained. 3.3 Cache and Virtual memory are explained 3.4 <b>Memory specifications</b> are prescribed for a user 3.5 Memory specifications are verified for a given computer
4. Understand input-output functions	4.1 Peripherals devices are explained 4.2 Input-output processing is explained 4.3 Bus interface is explained 4.4 <b>Modes of data transfer</b> are explained 4.5 <b>Input-output device specifications</b> are prescribed for a user

	4.6 Input-output device specifications are verified for a given computer
5. Understand computer arithmetic and logic	5.1 <b>Number systems</b> are explained 5.2 Integer and Floating point representations are demonstrated according to IEEE standard 5.3 Integer and Floating point arithmetic is explained 5.4 <b>Logic operators</b> are explained 5.5 Logic operations are explained 5.6 <b>Methods of representing logic operations</b> are demonstrated

## RANGE

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

Variable	Range
1. CPU specifications may include but is not limited to:	<ul style="list-style-type: none"> <li>• Brand</li> <li>• Chipset</li> <li>• Speed</li> <li>• Series</li> </ul>
2. Storage Technologies may include but is not limited to:	<ul style="list-style-type: none"> <li>• Solid state</li> <li>• Magnetic</li> <li>• Optical</li> </ul>
2. Memory specifications may include but is not limited to:	<ul style="list-style-type: none"> <li>• Speed</li> <li>• Size</li> <li>• Form factor</li> <li>• Type</li> <li>• Part Number</li> </ul>
3. Modes of data transfer may include but is not limited to:	<ul style="list-style-type: none"> <li>• Programmed I/O</li> <li>• Direct Memory Access I/O</li> <li>• Interrupt initiated I/O</li> </ul>
4. Input-output device specifications may include but is not limited to:	<ul style="list-style-type: none"> <li>• Monitor: Size, Resolution, Brand</li> <li>• Printer/Copier: Function, Speed, Resolution, Brand</li> <li>• Storage: Size, Brand, Data Transfer Rate</li> </ul>
5. Number systems	<ul style="list-style-type: none"> <li>• Decimal</li> <li>• Positional</li> </ul>

Variable	Range
may include but is not limited to:	<ul style="list-style-type: none"> <li>• Binary</li> <li>• Hexadecimal</li> </ul>
6. Logic Operators may include but is not limited to:	<ul style="list-style-type: none"> <li>• AND</li> <li>• OR</li> <li>• NOT</li> </ul>
7. Methods of representing logic operations may include but is not limited to:	<ul style="list-style-type: none"> <li>• Karnaugh maps</li> <li>• Logic gates</li> <li>• Truth tables</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

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

### Required skills

The individual needs to demonstrate the following skills:

- Communications (verbal and written);
- Time management;
- Problem solving;
- Planning;
- Decision Making;
- Research;

### Required knowledge

The individual needs to demonstrate knowledge of:

- Principles of computer organisation and design
- Central Processing Unit functions
- Computer memory functions
- Input-Output functions
- Computer arithmetic and logic

## EVIDENCE GUIDE

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

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Explained computer organization and architecture</p>
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	<p>1.2 Explained structure and function of computer components</p> <p>1.3 Identified hardware components of a computer</p> <p>1.4 Explained CPU architecture</p> <p>1.5 Explained role of registers</p> <p>1.6 Explained instruction representation and execution</p> <p>1.7 Prescribed CPU specifications according to a user's needs</p> <p>1.8 Verified CPU specifications for a given computer</p> <p>1.9 Explained memory organization</p> <p>1.10 Explained various storage technologies</p> <p>1.11 Explained Cache and Virtual memory</p> <p>1.12 Prescribed memory specifications according to a user's needs</p> <p>1.13 Verified memory specifications for a given computer</p> <p>1.14 Explained input-output processing</p> <p>1.15 Explained the bus interface</p> <p>1.16 Explained modes of data transfer</p> <p>1.17 Prescribed input-output device specifications according to a user's needs</p> <p>1.18 Verified specifications of input/output devices for a given computer</p> <p>1.19 Explained number systems</p> <p>1.20 Demonstrated integer and floating point representations</p> <p>1.21 Explained integer and floating point arithmetic</p> <p>1.22 Explained logic operations</p> <p>1.23 Demonstrated methods of representing logic operations</p>
<p>2. Resource Implications</p>	<p>The following resources should be provided:</p> <p>2.1 Access to relevant workplace where assessment can take place</p> <p>2.2 Appropriately simulated environment where assessment can take place</p>
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <p>3.1 Oral questioning</p> <p>3.2 Practical tests</p> <p>3.3 Observation</p> <p>3.4 Written test</p>

4. Context of Assessment	Competency may be assessed 4.1 Off the job 4.2 on the job 4.3 During industrial attachment
5 Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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