UNDERSTAND NETWORKING AND DISTRIBUTED SYSTEMS

UNIT CODE: CT/OS/CS/CR/07/6/B

UNIT DESCRIPTION:

This unit specifies the competencies required to understanding networking and distributed systems concept. It involves understanding networking and distributed systems, distributed system architectures, distributed processing and file management, setting up a network in a distributed environment understanding data communication standards and IP addressing and troubleshooting a network.

ELEMENT These describe the **key outcomes** which make up **workplace function**.	**PERFORMANCE CRITERIA** These are **assessable** statements which specify the required level of performance for each of the elements. ***(Bold and italicized terms are elaborated in the range.)***
1. Understand networking and distributed systems concepts	1.1 Fundamentals of networking are explained 1.2 ***Types of networks*** are illustrated 1.3 ***Network topologies*** are illustrated 1.4 Transmission media are outlined 1.5 Distributed system is explained 1.6 ***Types of distributed systems*** are illustrated 1.7 ***Models in distributed systems*** are illustrated 1.8 Network requirements for a site are specified
2. Understand distributed systems architectures	2.1 Distributed architecture is illustrated 2.2 ***Architecture styles*** are illustrated 2.3 ***Types of distributed system architectures*** are illustrated 2.4 Distributed system architecture requirements for a simulated site are specified.
3. Understand distributed processing and file management	3.1 ***Types of distributed processing*** are illustrated 3.2 Types of file systems are illustrated 3.3 ***File sharing and accessing methods*** are illustrated 3.4 Distributed file sharing and access is demonstrated
4. Set up a network in a distributed environment	4.1 Tools, materials and devices for network set up are identified according to the network type 4.2 The network devices are connected and configured according to local and international standards 4.3 Network software is installed and configured according to the user manual 4.4 Network performance is tested

5. Understand Data Communication Standards and IP addressing	5.1 OSI Model is outlined 5.2 Data communication components are explained Network IP address classes are demonstrated
6. Troubleshoot a network	6.1 Troubleshooting is explained. 6.2 ***Troubleshooting tools*** are demonstrated. 6.3 Troubleshooting of a network is done as per IEEE standards

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**
Types of networks may include but not limited to:	• LAN • WAN • MAN • PAN
Network topologies may include but not limited to:	• Bus • Star • Delta • Ring • mesh point-to-point
Types of distributed systems may include but not limited to:	• Computing • Information • Pervasive
Models in distributed systems may include but not limited to:	• Architecture • Interaction • Fault
Architecture styles may include but not limited to:	• Layered Architecture • Object Based Architecture • Data-centered Architecture • Event Based Architecture • Hybrid Architecture
Types of distributed system architecture may include but not limited to:	• Centralized • Decentralized • Hybrid

Variable	Range
Types of distributed processing	• Distributed • Parallel
File sharing and access methods may include but not limited to:	• Remote Access • Data-Caching
Troubleshooting tools may include but not limited to:	• Ping • Tracert / traceroute • Nslookup • Netstat • Pathping/mtr

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:

- Fundamentals of networking and distributed systems
- Distributed systems architectures
- Distributed processing and file management
- Setting up a network in a distributed environment
- Troubleshooting a network

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	Assessment requires evidence that the candidate: 1.1 Illustrated different types of networks 1.2 Illustrated different types of topologies 1.3 Specified network requirements for a site 1.4 Illustrated different types of distributed systems 1.5 Illustrated different types of distributed system architectures 1.6 Specified distributed system architecture requirements for a simulated site 1.7 Illustrated different types of distributed processing 1.8 Illustrated different types of file systems 1.9 Illustrated file sharing and accessing methods 1.10 Set up a network as per site requirements 1.11 Troubleshot a network as per IEEE standard 1.12 Illustrated different functions of OSI layers
1. 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. Methods of Assessment	Competency may be assessed through: 3.1 Oral tests 3.2 Observation 3.3 Practical demonstration 3.4 Written tests
3. Context of Assessment	Competency may be assessed 4.1 Off the job 4.2 on the job 4.3 During industrial attachment
4. Guidance information for assessment	5.1 Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.