

## COMPUTER NETWORK SOFTWARE INSTALLATION

**UNIT CODE:** 0612 551 05A

### Relationship to Occupational Standards

This unit addresses the Unit of Competency: Install Computer Network Software

**Unit Duration:** 200 Hours

### Unit Description

This unit covers the competencies required to install computer network software. It involves performing computer software installation, testing computer network software and conducting computer network software user training.

### Summary of Learning Outcomes

| LEARNING OUTCOMES                                  | DURATION (HOURS) |
|----------------------------------------------------|------------------|
| 1. Conduct Network Software Simulation             | 30               |
| 2. Perform Computer Network Software Installation  | 30               |
| 3. Test Computer Network Software                  | 30               |
| 4. Conduct Computer Network Software User Training | 50               |
| 5. Monitor Computer Network Software Performance   | 60               |
| <b>TOTAL</b>                                       | <b>200</b>       |

### Learning Outcomes, Content and Suggested Assessment Methods

| Learning Outcome                       | Content                                                                                                                                                                                                                                                                   | Suggested Assessment Methods |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 1. Conduct Network Software Simulation | 1.1 Computer network software requirements<br>1.1.1 Introduction to computer software<br>1.1.2 Computer network software<br>1.1.2.1 Network protocols and services<br>1.1.2.2 Operating systems<br>1.1.2.3 Network management software<br>1.1.2.4 Remote desktop software |                              |

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|                                                   | <p>1.1.2.5 Network backup and recovery software</p> <p>1.1.2.6 VoIP software</p> <p>1.2 Introduction to Installation and configuration of Computer network simulation Software</p> <p>1.2.1 Types of Computer network simulation Software</p> <p>1.2.1.1 Cisco (packet tracer)</p> <p>1.2.1.2 Graphical Network Simulator</p> <p>1.2.1.3 Wire shark</p> <p>1.2.2 Uses of network simulators</p> <p>1.2.3 Best practices in Installation and configuration of Computer network simulation Software</p> <p>1.3 Basic Network Simulations activities</p> <p>1.3.1 Simple Network Design</p> <p>1.3.2 Troubleshooting Network Issues</p> <p>1.3.3 Configuring Basic Protocols</p> |                                                                                                                                                                                                                                                       |
| 2. Perform Computer Network software installation | <p>2.1 Network operating system Installation</p> <p>2.1.1 Introduction to computer Network operating system</p> <p>2.1.2 Functions of a NOS</p> <p>2.1.2.1 File Sharing</p> <p>2.1.2.2 Print Sharing</p> <p>2.1.2.3 Resource Management</p> <p>2.1.2.4 Security</p> <p>2.1.2.5 Network Management</p> <p>2.1.3 Features of Using a NOS</p> <p>2.1.3.1 User authentication and authorization:</p> <p>2.1.3.2 File and directory services</p> <p>2.1.3.3 Network security</p> <p>2.1.3.4 Backup and recovery</p>                                                                                                                                                                | <ul style="list-style-type: none"> <li>● Practical test</li> <li>● Project</li> <li>● Portfolio of evidence</li> <li>● Oral questioning</li> <li>● Interviews</li> <li>● Third party report</li> <li>● Written tests</li> <li>● Case study</li> </ul> |

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|  | <ul style="list-style-type: none"> <li>2.1.3.5 Remote management</li> <li>2.1.3.6 Monitoring and reporting</li> <li>2.1.4 Benefits of Using a NOS <ul style="list-style-type: none"> <li>2.1.4.1 Improved network performance</li> <li>2.1.4.2 Enhanced security</li> <li>2.1.4.3 Simplified network management</li> <li>2.1.4.4 Increased collaboration</li> <li>2.1.4.5 Cost savings</li> </ul> </li> <li>2.2 Network monitoring and management tools <ul style="list-style-type: none"> <li>2.2.1 Network management tools <ul style="list-style-type: none"> <li>2.2.1.1 FortiManager</li> <li>2.2.1.2 OpManager Plus</li> <li>2.2.1.3 Azure Virtual</li> <li>2.2.1.4 WANQuantum Spark Security Management Portal</li> </ul> </li> <li>2.2.2 Network monitoring tools <ul style="list-style-type: none"> <li>2.2.2.1 Paessler PRTG Network Monitor</li> <li>2.2.2.2 Progress WhatsUp Gold</li> <li>2.2.2.3 Nagios XI LogicMonitor</li> <li>2.2.2.4 SolarWinds Network</li> <li>2.2.2.5 Performance Monitor</li> <li>2.2.2.6 Wireshark</li> <li>2.2.2.7 Nagios</li> <li>2.2.2.8 Zabbix</li> <li>2.2.2.9 Cisco Prime Infrastructure</li> </ul> </li> </ul> </li> <li>2.3 Network monitoring tools configuration <ul style="list-style-type: none"> <li>2.3.1 Types of network monitoring tools <ul style="list-style-type: none"> <li>2.3.1.1 Traffic monitoring tools</li> <li>2.3.1.2 Performance monitoring tools</li> </ul> </li> </ul> </li> </ul> |  |
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|                                   | 2.3.1.3 Security monitoring tools                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                       |
|                                   | 2.3.2 Network monitoring tools configuration strategies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                       |
| 3. Test Computer Network Software | <p>3.1 Network Software Testing</p> <p>3.1.1 Meaning and importance of software testing.</p> <p>3.1.2 Types of computer network Software testing performed as per user requirements</p> <p>3.1.2.1 Exploratory testing</p> <p>3.1.2.2 Test case design</p> <p>3.1.2.3 Defect reporting</p> <p>3.1.2.4 Performance testing</p> <p>3.1.2.5 Security testing</p> <p>3.1.2.6 User acceptance testing</p> <p>3.1.2.7 Functionality test</p> <p>3.1.3 Continuous Improvement of Computer Network Software</p> <p>3.1.3.1 Regular Reviews</p> <p>3.1.3.2 Security Awareness</p> <p>3.1.3.3 Training Incident Response Plan</p> <p>3.1.3.4 Proactive Monitoring</p> <p>3.2 Performing Corrective Actions on Computer Network Software</p> <p>3.2.1 Corrective actions</p> <p>3.2.2 Patch Management</p> <p>3.2.3 Configuration Management</p> <p>3.2.4 Security Measures</p> <p>3.2.5 Network Troubleshooting</p> <p>3.2.6 Performance Optimization</p> <p>3.2.7 Backup and Recovery</p> <p>3.2.8 Continuous Improvement of Computer Network Software</p> | <ul style="list-style-type: none"> <li>● Practical test</li> <li>● Project</li> <li>● Portfolio of evidence</li> <li>● Oral questioning</li> <li>● Interviews</li> <li>● Third party report</li> <li>● Written tests</li> <li>● Case study</li> </ul> |

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|                                                           | <p>3.2.8.1 Regular Reviews</p> <p>3.2.8.2 Security Awareness</p> <p>3.2.8.3 Training Incident Response Plan</p> <p>3.2.8.4 Proactive Monitoring</p> <p>3.3 Introduction to Computer software functionality test report</p> <p>3.3.1 Steps in conducting Computer software functionality test</p> <p>3.3.2 Computer software Functional testing types</p> <p>3.3.2.1 Unit testing</p> <p>3.3.2.2 Smoke testing</p> <p>3.3.2.3 User acceptance</p> <p>3.3.2.4 Regression testing</p> <p>3.3.2.5 Localization testing</p>                                                               |                                                                                                                                                                                                                                                                                                      |
| <p>4. Conduct Computer Network software user training</p> | <p>4.1 User skill gap</p> <p>4.1.1 Meaning of skill gap in computer networks</p> <p>4.1.2 Identification of skill gap in computer networks</p> <p>4.2 User training manuals</p> <p>4.2.1 Definition of training manual</p> <p>4.2.2 Types of computer network training manuals</p> <p>4.2.2.1 Cisco network training manual</p> <p>4.2.2.2 Microsoft certified network engineer associates</p> <p>4.2.2.3 Linux network training manual</p> <p>4.3 Network user training</p> <p>4.3.1 Key Concepts Network user training</p> <p>4.3.1.1 Basic network concepts and terminologies</p> | <ul style="list-style-type: none"> <li>● Practical test</li> <li>● Project</li> <li>● Portfolio of evidence</li> <li>● Oral questioning</li> <li>● Interviews</li> <li>● Third party report</li> <li>● Written tests</li> <li>● Case study</li> <li>● Written tests</li> <li>● Case study</li> </ul> |

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|                                                         | <p>4.3.1.2 Connecting to the networks</p> <p>4.3.1.3 Network security best practices</p> <p>4.3.1.4 Resources access and file sharing</p> <p>4.3.1.5 Performance optimization</p> <p>4.4 Training reports</p> <p>4.4.1 Meaning and identification of computer networks training reports.</p> <p>4.4.2 Types of computer networks training reports</p> <p>4.4.2.1 Training evaluation report</p> <p>4.4.2.2 Training completion report</p>                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                      |
| <p>5. Monitor computer network software performance</p> | <p>5.1 Real-time network monitoring</p> <p>5.1.1 Types of network software performance real –time monitoring.</p> <p>5.1.1.1 SNMP</p> <p>5.1.1.2 Packet sniffers</p> <p>5.1.1.3 Performance monitoring tools</p> <p>5.1.1.4 Flow-based analytics</p> <p>5.2 Bandwidth and Throughput analysis</p> <p>5.2.1 Definition of Bandwidth and Throughput</p> <p>5.2.2 Factors Affecting Throughput analysis</p> <p>5.2.2.1 Network Congestion</p> <p>5.2.2.2 Network Congestion</p> <p>5.2.2.3 Latency</p> <p>5.2.2.4 Packet Loss</p> <p>5.2.2.5 Protocol Overhead</p> <p>5.2.2.6 Hardware Limitations</p> <p>5.2.3 Tools for measuring and optimizing throughput and bandwidth</p> | <ul style="list-style-type: none"> <li>○ Practical test</li> <li>○ Project</li> <li>○ Portfolio of evidence</li> <li>○ Oral questioning</li> <li>○ Interviews</li> <li>○ Third party report</li> <li>○ Written tests</li> <li>○ Case study</li> <li>○ Written tests</li> <li>○ Case study</li> </ul> |

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|  | <p>5.2.4 Network performance monitoring tools</p> <p>5.2.4.1 Speed test applications</p> <p>5.2.4.2 Quality of service</p> <p>5.2.4.3 Traffic analysis</p> <p>5.2.4.4 Bandwidth management and control tools</p> <p>5.2.4.5 Predictive analytics and capacity planning tools</p> <p>5.2.5 Best practices for managing bandwidth and throughput</p> <p>5.3 Network Alerts and notifications</p> <p>5.3.1 Types of Network Alerts and notifications</p> <p>5.3.1.1 Security alerts</p> <p>5.3.1.2 Performance alerts</p> <p>5.3.1.3 Hardware alerts</p> <p>5.3.1.4 Configuration alerts</p> |  |
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### Suggested Methods of delivery

- Role playing
- Viewing of related videos
- Group discussions.
- Instructor led facilitation using active learning strategies.
- Projects.
- Demonstrations.
- Site visits.

### Recommended Resources for 25 Trainees

| S/No.    | Category/Item             | Description/Specifications | Quantity | Recommended Ratio<br>(Trainee: Item) |
|----------|---------------------------|----------------------------|----------|--------------------------------------|
| <b>A</b> | <b>Learning Materials</b> |                            |          |                                      |
| 1.       | Textbooks                 |                            | 13 pcs   | 2:1                                  |

|          |                                                 |                   |          |      |
|----------|-------------------------------------------------|-------------------|----------|------|
| 2.       | Installation manuals                            |                   |          |      |
| 3.       | Flip Charts                                     |                   |          |      |
| 4.       | PowerPoint presentations                        | For trainer's use |          |      |
| <b>B</b> | <b>Learning Facilities &amp; infrastructure</b> |                   |          |      |
| 5.       | Lecture/theory room                             |                   | 1        | 25:1 |
| 6.       | Laboratory                                      |                   | 1        | 25:1 |
| <b>C</b> | <b>Consumable materials</b>                     |                   |          |      |
| 7.       | Printing papers                                 |                   | 1 ream   | 1:20 |
| 8.       | Toners/Cartridges                               |                   | 2 pcs    | 13:1 |
| 9.       | Assorted colour of whiteboard markers           |                   |          |      |
| <b>D</b> | <b>Tools and Equipment</b>                      |                   |          |      |
| 10.      | Computers                                       |                   | 25 pcs   | 1:1  |
| 11.      | Projector                                       |                   | 1 pc     | 25:1 |
| 12.      | Flash drives                                    |                   | 25 pairs | 1:1  |
| 13.      | External CD/DVD drives                          |                   | 13 pcs   | 2:1  |

### MODULE III

| UNIT<br>CATEGORY | UNIT CODE    | UNIT NAME                                  | DURATION<br>(Hours) |
|------------------|--------------|--------------------------------------------|---------------------|
| CORE             | 0612 551 06A | Computer Network<br>Security Configuration | 210                 |
| CORE             | 0612 551 07A | Computer Network<br>Maintenance            | 210                 |
|                  |              | <b>Grand total</b>                         | <b>420</b>          |