

## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	<b>INFRASTRUCTURE SUPPORT</b>								
<b>Job Area</b>	<b>COMPUTER SYSTEM ADMINISTRATION</b>								
<b>Competency Unit Title</b>	<b>SERVER CONFIGURATION</b>								
<b>Learning Outcome</b>	<p>The person who is competent in this CU shall be able to optimise server performance and manage server resources by creating configuration script to arrange server functional units according user's requirement. Upon completion of this competency unit, trainees will be able to: -</p> <ul style="list-style-type: none"> <li>• Plan server deployment</li> <li>• Monitor server installation</li> <li>• Carry out server configuration</li> <li>• Produce server configuration report</li> </ul>								
<b>Competency Unit ID</b>	1	<b>Competency Type</b>	Core	<b>Level</b>	4	<b>Training Duration</b>	260 Hours	<b>Credit Hours</b>	26
<b>Work Activities</b>	<b>Related Knowledge</b>	<b>Related Skills</b>			<b>Attitude / Safety / Environmental</b>		<b>Training Hour</b>	<b>Delivery Mode</b>	<b>Assessment Criteria</b>
1. Plan server deployment	i. Types of server: <ul style="list-style-type: none"> <li>• e-mail server,</li> <li>• web server</li> <li>• DNS</li> <li>• Proxy</li> <li>• Dynamic Host Configuration Protocol (DHCP)</li> <li>• file transfer protocol (FTP)</li> <li>• database</li> </ul> ii. Types of platforms / Operating System(OS) : <ul style="list-style-type: none"> <li>• Licensed OS</li> <li>• Non-licensed OS</li> </ul>						21 hours	Lecture, Case study/ problem based learning	i. Network diagram interpreted ii. Analyse user's requirements analysed iii. Types of server and Operating System (OS) determined iv. Installation tools and server software

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	iii. Computer network diagram interpretation <ul style="list-style-type: none"> <li>• Symbol in network diagram</li> <li>• Colours in network diagram</li> </ul> iv. Installation tools and server software media: <ul style="list-style-type: none"> <li>• CD-ROM / DVD</li> <li>• External drive</li> <li>• Network Magnetic tape</li> <li>• Installation manual</li> </ul> v. Server deployment plan documents <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Timeline</li> <li>• Schedule</li> <li>• Job checklist</li> <li>• Manpower</li> <li>• Gantt chart</li> </ul> vi. Server installation job order content <ul style="list-style-type: none"> <li>• Job specification</li> <li>• Job checklist</li> <li>• Timeline/ schedule</li> </ul>					media selected <ul style="list-style-type: none"> <li>• Software version verified</li> <li>• Compatibility confirmed</li> </ul> v. Work breakdown structure prepared           vi. Server configuration plan produced           vii. Server installation checklist prepared and job order produced
		i. Interpret network diagram ii. Analyse user's require-		31 hours	Demonstration, observation and scenario	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> <li>ments</li> <li>iii. Determine types of server and Operating System(OS)</li> <li>iv. Determine installation tools and server software media</li> <li>v. Prepare work breakdown structure</li> <li>vi. Produce server configuration plan</li> <li>vii. Prepare server installation job order</li> </ul>	<p><i>Attitude:</i></p> <ul style="list-style-type: none"> <li>i. Analytical mind in determining types of server and OS</li> <li>ii. Detail in preparing server installation job order</li> </ul> <p><i>Safety/Environment:</i></p> <ul style="list-style-type: none"> <li>i. Adhere to company SOP</li> </ul>		based training	
2. Monitor server installation	<ul style="list-style-type: none"> <li>i. Server installation manual</li> <li>ii. Server operational function <ul style="list-style-type: none"> <li>• Hardware <ul style="list-style-type: none"> <li>- Hard disk</li> <li>- Monitor</li> </ul> </li> <li>• Software <ul style="list-style-type: none"> <li>- operating system,</li> </ul> </li> </ul> </li> </ul>			12 hours	Lecture, group discussion, case study or problem based learning	<ul style="list-style-type: none"> <li>i. Skills and competency level required for server installation identified and listed out</li> <li>ii. Server installation report analysed is-</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>- applications software,</li> <li>- drivers,</li> <li>- data</li> <li>- configurations</li> <li>• peripherals <ul style="list-style-type: none"> <li>- printer</li> <li>- Scanner</li> <li>- Multifunction machine</li> <li>- Mobile devices</li> </ul> </li> </ul> <p>iii. Server installation report analysis:</p> <ul style="list-style-type: none"> <li>• Rectification of job order variance</li> <li>• Restoration of operating system, software, applications, drivers, data and configurations</li> <li>• Verification of installation report</li> </ul> <p>iv. Managerial skill:</p> <ul style="list-style-type: none"> <li>• Delegation</li> <li>• Monitoring</li> <li>• Supervision</li> <li>• Coordinating</li> </ul>					<ul style="list-style-type: none"> <li>sues identified and improvement proposed</li> <li>• Server installation record analysed</li> <li>• Job variance assessed</li> <li>• Variance rectified</li> <li>• Restore operating system, software, applications, drivers, data and configurations</li> </ul> <p>iii. Server hardware, peripherals and software operational function assessed</p> <p>iv. Server installation work verified</p>
		<p>i. Identify subordinate skills and competency level</p> <p>ii. Delegate and supervise</p>		19 hours	Observation & Project	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		subordinate for server installation task and monitor work progress iii. Analyse server installation report <ul style="list-style-type: none"> <li>• Analyse server installation record</li> <li>• Assess job variance</li> <li>• Rectify variance</li> <li>• Restore operating system, software, applications, drivers, data and configurations</li> </ul> iv. Asses server hardware, peripherals and software operational function v. Verify server installation work	<u>Attitude:</u> i. Analytical mind in assessing server installation report ii. Accurate in identifying server installation work variance  <u>Safety/Environment:</u> i. Adhere to company SOP			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
3. Carry out server configuration	<ul style="list-style-type: none"> <li>i. Patch installation: <ul style="list-style-type: none"> <li>• firmware</li> <li>• software</li> </ul> </li> <li>ii. OS update</li> <li>iii. Server configuration setting: <ul style="list-style-type: none"> <li>• user configuration</li> <li>• application configuration</li> <li>• server roles configuration: <ul style="list-style-type: none"> <li>- e-mail server</li> <li>- web server</li> <li>- DNS</li> <li>- proxy</li> <li>- Dynamic Host Configuration Protocol (DHCP)</li> <li>- File Transfer Protocol (FTP)</li> <li>- database</li> <li>- remote access</li> </ul> </li> <li>• monitoring agents: <ul style="list-style-type: none"> <li>- NRPE</li> <li>- NMS (Network Monitoring System)</li> </ul> </li> </ul> </li> <li>iv. Server restoration and back-up setting</li> <li>v. Type of server unit testing:</li> </ul>			64 hours	Lecture, group discussion, case study / problem based learning	<ul style="list-style-type: none"> <li>i. Patch installation performed</li> <li>ii. Operating system updated</li> <li>i. User configuration carried out</li> <li>ii. Application configuration performed</li> <li>iii. Server roles configured</li> <li>iv. Monitoring agents installed</li> <li>vii. Server restoration and back-up setting configured</li> <li>viii. Server unit testing (connectivity test, stress test, functionality test) conducted, test result recorded and analysed</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Connectivity test</li> <li>• Stress test</li> <li>• Functionality test</li> </ul> vi. UAT (User Acceptance Test)					ix. UAT performed
		i. Perform patch installation ii. Update OS iii. Carry out user configuration iv. Perform application configuration v. Configure server vi. Install monitoring agents x. Configure server restoration and back-up setting xi. Conduct server unit testing (connectivity test, stress test, functionality test), record and analyse test result xii. Perform UAT	<u>Attitude:</u> i. Cautious in performing patch installation ii. Systematic in carrying out server configuration iii. Accurate in conducting server unit testing	97 hours	Observation Project, simulation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
			<u>Safety/Environment.</u> i. Adhere to safety procedure when conducting unit test			
4. Produce server configuration report	i. Report writing ii. Document management system <ul style="list-style-type: none"> <li>• Coding: naming convention</li> <li>• Recording</li> <li>• Filing</li> <li>• Document safety</li> <li>• Confidentiality</li> </ul> iii. Documentation of server configuration information and documents <ul style="list-style-type: none"> <li>• CD resources               <ul style="list-style-type: none"> <li>- Operating system,</li> <li>- software</li> <li>- drivers</li> <li>- backup</li> </ul> </li> <li>• Warranty cards</li> <li>• Licensing</li> <li>• Server set-up checklist</li> <li>• Inventory record</li> </ul> iv. Prepare server configuration manual			6 hours	Lecture & case study	i. Server configuration documentation carried out <ul style="list-style-type: none"> <li>• CD resources burn</li> <li>• Warranty cards endorsed</li> <li>• Licensing endorsed</li> <li>• Server set-up checklist updated</li> <li>• Inventory record updated</li> </ul> ii. Server configuration manual produced iii. Server test result analysis report produced iv. User Accept-



Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• user configuration</li> <li>• application configuration</li> <li>• server roles configuration</li> <li>• Server restoration and back-up setting</li> </ul> <p>v. Analysis of server test result</p> <p>vi. User Acceptance Test</p> <p>vii. Server configuration report contents:</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and Timeline</li> <li>• Job specification</li> <li>• Job checklist</li> <li>• Server configuration team members</li> <li>• Job execution details: <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team member involved</li> <li>- Job variance</li> <li>- Rectification</li> </ul> </li> <li>• Other matters / issues related to server configuration</li> </ul>					<p>ance Test report prepared</p> <p>v. Server configuration report produced and executed tasks highlighted:</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and timeline</li> <li>• Job specification</li> <li>• Job checklist</li> <li>• Server configuration team members</li> <li>• Job execution details: <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team members involved</li> <li>- Job variance</li> <li>- Rectification</li> </ul> </li> <li>- Other matters / issues related to server configuration</li> </ul>
		i. Carry out server configuration documentation		10 hours	Coaching & Project	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> <li>• Burn CD resources</li> <li>• Endorse Warranty cards</li> <li>• Endorse licensing</li> <li>• Update server set-up checklist</li> <li>• Update inventory record</li> </ul> <p>ii. Produce server configuration manual</p> <p>iii. Server test result analysis report produced</p> <p>iv. User Acceptance Test report prepared</p> <p>v. Produce server configuration report and highlight executed tasks:</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and timeline</li> <li>• Job specification</li> <li>• Job checklist</li> <li>• Server configuration team members</li> <li>• Job execution details: <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team members involved</li> <li>- Job variance</li> <li>- Rectification</li> </ul> </li> <li>• Other matters / issues related to serv-</li> </ul>				

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		er configuration	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> <li>i. Clear and firm when supervising subordinate for documentation tasks</li> <li>ii. Accurate and transparent in preparing report</li> </ul> <p><u>Safety/Environment:</u></p> <ul style="list-style-type: none"> <li>i. Adhere to document confidentiality and safety policy</li> </ul>			

## Employability Skills

Core Abilities	Social Skills
04.08 Develop and negotiate staffing plans 04.09 Prepare project/work plans 05.03 Allocate and record usage of financial and physical resources 05.04 Delegate responsibilities and/or authority	1. Teamwork 2. Learning skill 3. Self-discipline 4. Leadership skill 5. Conceptual skills 6. Interpersonal skills 7. Communication skills 8. Multitasking and prioritizing

## Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1) LCD Projector 2) Computer / laptop 3) Sample of inventory record 4) Sample of Manufacturer' Instruction Manual 5) Sample of Vendor Service Manual 6) Sample of SLA 7) Server <ul style="list-style-type: none"> <li>- Hard disk</li> <li>- Monitor</li> <li>- operating system,</li> </ul>	1:25 1:1 1:1 1:1 1:1 1:25

<ul style="list-style-type: none"> <li>- applications software,</li> <li>- drivers,</li> <li>- Monitoring agents</li> </ul>	
8) peripherals <ul style="list-style-type: none"> <li>- printer</li> <li>- Scanner</li> </ul>	1:25
9) Patches	1:25
10) DNS	1:25
11) DHCP	1:25
12) FTP	1:1
13) Sample of warranty card	

<b>REFERENCES</b>	
1.	<a href="#">Joseph L Jorden</a> (2010). <i>Microsoft SQL Server 2005 Implementation and Maintenance</i> . John Wiley & Sons. ISBN-13: 978-0-470-76754-2
2.	<a href="#">Rabah, Kefa</a> (2012). <i>Red Hat Enterprise Linux (Rhel) 6 Server Installation &amp; Administration</i> . Lap Lambert Academic Publishing, ISBN-13: 978-3-8465-1118-3
3.	<a href="#">Sharon Crawford</a> , <a href="#">Charlie Russel</a> (2008). <i>Windows Server 2008</i> . Microsoft Press. ISBN-13: 978-0-7356-2505-1
4.	<a href="#">Steve Silva</a> (2008). <i>Web Server Administration</i> (1st Edition). Course Technology Ptr. ISBN-13: 978-1-4239-0323-9
5.	<a href="#">Tim Parks</a> (2012). <i>Server</i> . Harvill Secker. ISBN-13: 978-1-84655-577-0

## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	<b>INFRASTRUCTURE SUPPORT</b>								
<b>Job Area</b>	<b>COMPUTER SYSTEM ADMINISTRATION</b>								
<b>Competency Unit Title</b>	<b>COMPUTER NETWORK INSTALLATION MANAGEMENT</b>								
<b>Learning Outcome</b>	<p>The person who is competent in this CU shall be able to prepare a link between server and computer system in order them to access to the Internet, to communicate each other, and to execute tasks according to user's requirement. Upon completion of this competency unit, trainees will be able to: -</p> <ul style="list-style-type: none"> <li>• Analyse computer network requirements</li> <li>• Plan computer network installation</li> <li>• Manage computer network installation work</li> <li>• Produce computer network installation management report</li> </ul>								
<b>Competency Unit ID</b>	2	<b>Competency Type</b>	Core	<b>Level</b>	4	<b>Training Duration</b>	240 Hours	<b>Credit Hours</b>	24
<b>Work Activities</b>	<b>Related Knowledge</b>	<b>Related Skills</b>			<b>Attitude / Safety / Environmental</b>	<b>Training Hours</b>	<b>Delivery Mode</b>	<b>Assessment Criteria</b>	
1. Analyse computer network set-up specification	1. Company network security policy 1i. Service Level Agreement (SLA) 1ii. Service Level Guarantee (SLG) 1iv. Types of computer network connectivity: <ul style="list-style-type: none"> <li>• LAN</li> <li>• WAN</li> <li>• MAN</li> </ul>					18 hours	Lecture, Case study, problem based learning	i. Computer network security policy interpreted and security checklist prepared  ii. Computer network topology interpreted  iii. Types of computer network connectivity identified	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<p>⌘. Types of computer network wireless technology</p> <ul style="list-style-type: none"> <li>• WIFI</li> <li>• WIMAX</li> <li>• Mobile</li> </ul> <p>⌘Ⓛ. Types of computer network encryption</p> <ul style="list-style-type: none"> <li>• Wired Equivalent Privacy (WEP)</li> <li>• Work Progress Administration (WPA/ WPA2)</li> <li>• Advance Encryption Standard (AES)</li> <li>• Remote Authentications Dial In User Service (RADIUS)</li> <li>• Temporal Key Integrity Protocol (TKIP)</li> </ul> <p>⌘Ⓜ. Types of server rack</p> <ul style="list-style-type: none"> <li>• 42U</li> <li>• 19U</li> <li>• Open Frame Rack</li> <li>• Post Relay Rack</li> </ul> <p>⌘ⓂⓂ. Types of computer network Topology</p> <ul style="list-style-type: none"> <li>• Star</li> <li>• Bus</li> <li>• Mesh</li> </ul>					<p>iv. Wireless technology assessed and requirements identified</p> <p>v. Computer file and printer sharing security determined</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Hybrid</li> <li>• Ring</li> <li>• Tree</li> </ul> ιξ. Computer file and printer sharing					
		i. Interpret types of computer network topology ii. Identify types of computer network connectivity iii. Define wireless technology requirements iv. Interpret type of computer network encryption and identify the requirements v. Determine computer file and printer sharing security	<u>Attitude:</u> i. Precise in identifying types of computer network connectivity ii. Practical in determining types of server form factor iii. Detail in interpreting network encryption	42 hours	Demonstration, observation and scenario based training	



Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<u>Safety/Environment.</u> i. Adhere to company procedure and computer system and network security policy			
2. Plan computer network installation	i. Types of network installation schedule <ul style="list-style-type: none"> <li>• Interruptive</li> <li>• Non Interruptive</li> </ul> ii. Computer network Interface Card (NIC) installation and connection <ul style="list-style-type: none"> <li>• Computer PC</li> <li>• Server</li> <li>• Scanner</li> <li>• Printer/multifunction machine</li> </ul> iii. Computer network installation equipment <ul style="list-style-type: none"> <li>• Main distribution frame               <ul style="list-style-type: none"> <li>- Switch</li> <li>- Router</li> <li>- Access Point</li> <li>- Firewall</li> </ul> </li> <li>• Patch panel</li> <li>• RJ 45 Faceplate</li> </ul>					i. Network installation requirement determined and checklist prepared  ii. Resources requirement related to network installation estimated  iii. Installation equipment determined and prepared  iv. Work breakdown structure prepared  v. Network in-

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Network cable tester</li> </ul> <p>iv. Computer network installation plan</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Timeline</li> <li>• Schedule</li> <li>• Job checklist</li> <li>• Manpower</li> <li>• Gantt chart</li> <li>• Budget</li> </ul> <p>v. Computer network cabling job order content</p> <ul style="list-style-type: none"> <li>• Job specification</li> <li>• Job checklist</li> <li>• Timeline/ schedule</li> <li>• Subordinate name</li> </ul>					<p>stallation management plan produced</p> <p>vi. Network installation checklist and job order prepared</p>
		<p>i. Evaluate network installation requirement</p> <p>ii. Estimate resources requirement related to computer network installation</p> <p>iii. Determine installation equipment and tools</p> <p>iv. Prepare work breakdown structure</p> <p>v. Produce computer network installation plan</p> <p>vi. Prepare network install-</p>				

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		ation checklist and job order	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> <li>i. Accurate in estimating resource requirement</li> <li>ii. Meticulous in evaluating network installation requirement</li> <li>iii. Detail in preparing work breakdown structure</li> </ul> <p><u>Safety/Environment:</u></p> <ul style="list-style-type: none"> <li>ii. Adhere to company procedure and computer system and network security policy</li> </ul>			
3. Manage computer network installation work	<ul style="list-style-type: none"> <li>i. Computer network Rack assembly <ul style="list-style-type: none"> <li>• 42U</li> <li>• 19U</li> <li>• Open Frame Rack</li> <li>• Post Relay Rack</li> </ul> </li> </ul>			36 hours	Lecture, group discussion, case study or problem based learning	<ul style="list-style-type: none"> <li>i. Skills and competency level in network installation identified and listed out</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	ii. Computer network address configuration <ul style="list-style-type: none"> <li>• IP address</li> <li>• Subnet Mask</li> <li>• Gateway</li> <li>• Domain Name Server (DNS)</li> </ul> iii. Computer network configuration and inter-connectivity testing <ul style="list-style-type: none"> <li>• Stress Test</li> <li>• Stability test</li> <li>• Frequency Scanning test</li> <li>• Power Load test</li> <li>• Remote Test</li> <li>• Ping Test</li> <li>• Network Speed Test</li> <li>• Services testing/applications test</li> <li>• Wireless Authentication test</li> <li>• Internet browsing test</li> <li>• Tracert test</li> <li>• Internet browser application test</li> <li>• Print-out test</li> <li>• Scanning test</li> </ul> iv. Computer network test					ii. Computer network installation tasks listed out and interpreted iii. Computer network installation report analysed iv. Computer network installation job order variance reviewed and rectified v. Computer network configuration and inter-connectivity test result analysed and interpreted vi. Computer network installation expenses controlled and monitored vii. UAT performed and

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	checklist  v. User Acceptance Test (UAT)  vi. Managerial skill <ul style="list-style-type: none"> <li>• Delegation</li> <li>• Monitoring</li> <li>• Coaching</li> <li>• Coordinating</li> </ul>					test result recorded
	i. Identify subordinate skills and competency level in network installation ii. Delegate and supervise subordinate for computer network installation and monitor work progress iii. Analyse network installation report iv. Review and rectify computer network installation job order variance  v. Analyse computer network configuration and interconnectivity test result vi. Control computer network installation expenses vii. Perform UAT and record test result		84 hours	Demonstration, observation and scenario based training		

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<p><u>Attitude:</u></p> <ul style="list-style-type: none"> <li>i. Analytical mind in assessing network installation report</li> <li>ii. Accurate in rectifying job order variance</li> <li>iii. Detail and thorough when conducting network configuration and interconnectivity test</li> </ul> <p><u>Safety/Environment</u></p> <ul style="list-style-type: none"> <li>i. Adhere to company SOP and security procedure</li> </ul>			
4. Produce computer network installation management report	<ul style="list-style-type: none"> <li>i. Report writing</li> <li>ii. Analysis of computer network configuration and interconnectivity test result</li> <li>iii. UAT report</li> <li>iv. Document management system</li> </ul>			14 hours	Lecture, group discussion, case study or problem based learning	<ul style="list-style-type: none"> <li>i. Computer network configuration and interconnectivity test result analysis report prepared</li> <li>ii. UAT result analysis report</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Coding: naming convention</li> <li>• Recording</li> <li>• Filing</li> <li>• Document safety</li> <li>• Confidentiality</li> </ul> <p>v. Computer network installation management report contents</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and Timeline</li> <li>• Job specification</li> <li>• Job checklist</li> <li>• Network installation team members</li> <li>• Job execution details:               <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team member involved</li> <li>- Job variance</li> <li>- Rectification</li> </ul> </li> <li>• Expenses</li> <li>• Other related matters</li> </ul> <p>vi. Documentation of network installation management documents</p>	<p>i. Prepare computer network configuration and interconnectivity</p>		34 hours	Observation and Project	<p>produce</p> <p>iii. Computer network installation management report produced and executed tasks highlighted:</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and timeline</li> <li>• Job specification</li> <li>• Job checklist</li> <li>• Team members</li> <li>• Job execution details:               <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team members involved</li> <li>- Job variance</li> <li>- Rectification</li> </ul> </li> <li>• Expenses report</li> </ul> <p>vii. Network installation management documents com-</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>test result analysis report</p> <p>ii. Produce UAT report</p> <p>iii. Prepare Computer network installation management report and highlight executed tasks details:</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and timeline</li> <li>• Job specification</li> <li>• Job checklist</li> <li>• Server maintenance team members</li> <li>• Job execution details: <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team member s involved</li> <li>- Job variance</li> <li>- Rectification</li> </ul> </li> <li>• Expenses</li> <li>• Other related matters</li> </ul> <p>viii. Compile and file network installation management documents</p>	<p><u>Attitude:</u></p> <p>i. Accountable in producing network installation</p>			<p>plied and filed according to company document management system</p>



Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			management report ii. Precise and accurate in performing network configuration and interconnectivity test  <u>Safety/Environment:</u> i. Adhere to document confidentiality and safety policy			

### Employability Skills

Core Abilities	Social Skills
04.08 Develop and negotiate staffing plans 04.09 Prepare project/work plans 04.10 Utilize science and technology to achieve goals 05.03 Allocate and record usage of financial and physical resources 05.04 Delegate responsibilities and/or authority 05.05 Coordinates contract and tender activities 06.08 Identify and analyze effect of technology on the environment	1. Teamwork 2. Learning skill 3. Self-discipline 4. Leadership skill 5. Conceptual skills 6. Interpersonal skills 7. Communication skills 8. Multitasking and prioritizing

**Tools, Equipment and Materials (TEM)**

ITEMS	RATIO (TEM : Trainees)
1) LCD Projector	1:25
2) Laptop/PC	1:25
3) Cutter	1:5
4) Pliers	1:5
5) Crimping tools	1:5
6) Screw Drivers	1:5
7) Network cable	1:5
8) Test Gears	1:5
9) Earth Megger	1:5
10) Wire Continuity Tester	1:5
11) Spectrum analyser	1:5
12) Stability Tester	1:5
13) Volt meter	1:5
14) Ammeter	1:5
15) Cable tester	1:5
16) Patch panel	1:5
17) Patch cord	1:5
18) Face plate	1:5
19) Router	1:5
20) Network cable	1:5
21) Modem	1:5
22) Switch	1:5
23) Sample SLA	1:1
24) Sample manufacturer instruction manual	1:1

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7.

## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>		<b>INFRASTRUCTURE SUPPORT</b>								
<b>Job Area</b>		<b>COMPUTER SYSTEM ADMINISTRATION</b>								
<b>Competency Unit Title</b>		<b>COMPUTER SYSTEM SECURITY CONTROL</b>								
<b>Learning Outcome</b>		<p>The person who is competent in this CU shall be able to to protect computer system and data from damage, failure and un-accessible through system access controls, data access control, and system design and system procedure in accordance with company security policy. Upon completion of this competency unit, trainees will be able to: -</p> <ul style="list-style-type: none"> <li>• Analyse computer system security requirements</li> <li>• Plan computer system security control</li> <li>• Administer computer system security</li> <li>• Produce computer security control report</li> </ul>								
<b>Competency Unit ID</b>		3	<b>Competency Type</b>	Core	<b>Level</b>	4	<b>Training Duration</b>	200 Hours	<b>Credit Hours</b>	20
<b>Work Activities</b>	<b>Related Knowledge</b>	<b>Related Skills</b>			<b>Attitude / Safety / Environmental</b>	<b>Training Hour</b>	<b>Delivery Mode</b>	<b>Assessment Criteria</b>		
1. Analyse computer system security requirements	i. Computer system security standard <ul style="list-style-type: none"> <li>• ISO/IEC Standard 17799:2005- Information Technology-Code of Practice for Information Security Management</li> <li>• ISO/IEC 27002</li> <li>• Malaysia Cyber law: Computer Crime Act 1997</li> </ul> ii. Company policy related					16 hours	Lecture, Case study, problem based learning	i. Computer system security standard interpreted and security checklist produced  ii. Computer system physical security (door access, CCTV, asset security) requirements evaluated  iii. Assess computer system security equipment, hard-		

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<p>to computer system security</p> <p>iii. Computer system security management</p> <ul style="list-style-type: none"> <li>• Physical control</li> <li>• Procedural control</li> <li>• Technical control</li> <li>• Legal and regulatory or compliance controls</li> </ul> <p>iv. Computer system security</p> <ul style="list-style-type: none"> <li>• Physical security <ul style="list-style-type: none"> <li>- door access</li> <li>- CCTV</li> <li>- asset security</li> </ul> </li> <li>• Computer system security <ul style="list-style-type: none"> <li>- Hardware <ul style="list-style-type: none"> <li>o Firewall</li> <li>o EMS (Environment Monitoring System)</li> </ul> </li> <li>- Software <ul style="list-style-type: none"> <li>o Anti-virus</li> <li>o Internal firewall</li> <li>o Data security</li> <li>o Encryption</li> <li>o Access restriction</li> <li>o Authentication</li> </ul> </li> </ul> </li> </ul>					<p>ware and software requirements assessed</p> <p>iv. Computer system security threats identified</p> <p>v. Risk and business impact related to computer system interpreted</p> <p>vi. Computer system security parameter determined</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>○ File and printer sharing</li> <li>○ Hardening</li> <li>● Security tool <ul style="list-style-type: none"> <li>- Cable locks</li> </ul> </li> </ul> <p>v. Computer system security threats, such as:</p> <ul style="list-style-type: none"> <li>● Viruses</li> <li>● Trojan horse programs</li> <li>● Vandalism</li> <li>● Hackers</li> <li>● spammers</li> <li>● Data interception</li> <li>● Legal and regulatory or compliance</li> <li>● etc</li> </ul> <p>vi. Risk and business impact related to computer system security, such as</p> <ul style="list-style-type: none"> <li>● Loss of data</li> <li>● Loss of IT function</li> <li>● Damages</li> <li>● etc</li> </ul> <p>vii. Computer system security parameters</p> <ul style="list-style-type: none"> <li>● Server</li> <li>● Public zone</li> <li>● LAN</li> <li>● Demilitarize zone</li> </ul>					

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	(DMZ)	<ul style="list-style-type: none"> <li>i. Interpret computer system security standard</li> <li>ii. Evaluate computer system physical security (door access, CCTV, asset security) requirements</li> <li>iii. Assess computer system security equipment, hardware and software requirements</li> <li>iv. Identify computer system security threats</li> <li>v. Interpret risk and business impact related to computer system security</li> <li>vi. Determine computer system security parameters</li> </ul>	<p><i>Attitude:</i></p> <ul style="list-style-type: none"> <li>i. Details in identifying computer system security requirements</li> <li>ii. Analytical mind in interpreting risk</li> </ul>	20 hours	Demonstration, observation and scenario based training	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
			<p>and business impact related to computer system security</p> <p>iii. Meticulous and thorough in determining computer system security zone</p> <p><u>Safety/Environment.</u></p> <p>i. Adhere to computer system security standard and company procedure</p>			
<p>2. Plan computer system security control</p>	<p>i. Computer system security access control:</p> <ul style="list-style-type: none"> <li>• System Access</li> <li>• Data Access method <ul style="list-style-type: none"> <li>- Storing</li> <li>- Retrieval</li> </ul> </li> <li>• User access right <ul style="list-style-type: none"> <li>- Copy</li> <li>- Delete</li> <li>- Read</li> <li>- Write</li> </ul> </li> <li>• Authentication</li> </ul> <p>ii. Types of company data:</p> <ul style="list-style-type: none"> <li>• Public data: <ul style="list-style-type: none"> <li>- website</li> </ul> </li> <li>• Private data <ul style="list-style-type: none"> <li>- Email</li> </ul> </li> </ul>			<p>20 hours</p>	<p>Lecture &amp; case study / problem based learning</p>	<p>i. Computer system security access control determined</p> <p>ii. Computer system as built diagram interpreted</p> <p>iii. Company data security protection method identified</p> <p>iv. Network security control tools selected</p>



Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>- Personal data</li> <li>• Confidential data <ul style="list-style-type: none"> <li>- Financial</li> <li>- HR</li> </ul> </li> <li>iii. Remote access control</li> <li>iv. Computer system as built diagram</li> <li>v. Internet security control <ul style="list-style-type: none"> <li>• Firewall</li> <li>• Antivirus</li> <li>• Software patches</li> </ul> </li> <li>vi. Company resources: <ul style="list-style-type: none"> <li>• Budget</li> <li>• Staff - Knowledge and skills</li> <li>• Hardware specification</li> <li>• Software compatibility</li> <li>• Equipment and facilities</li> </ul> </li> <li>vii. Computer system security control plan <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Work schedule</li> <li>• Computer system security checklist</li> <li>• Security risks</li> <li>• Security strategies</li> <li>• Computer system lo-</li> </ul> </li> </ul>					<ul style="list-style-type: none"> <li>v. Resources to implement computer system security control estimated</li> <li>vi. Work breakdown structure and timeline for computer system security control prepared</li> <li>vii. Computer system security risks defined</li> <li>viii. Computer system security strategies determined</li> <li>ix. Computer system logon and authentication policy prepared</li> <li>x. Computer system security control plan produced</li> <li>xi. Computer system security checklist prepared and job order produced</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	gon and authentication <ul style="list-style-type: none"> <li>• Administrative policies</li> </ul> viii. Job order content <ul style="list-style-type: none"> <li>• Job specification</li> <li>• Job checklist</li> <li>• Timeline/ schedule</li> <li>• Subordinate name</li> </ul>					
		i. Determine computer system security access control ii. Interpret computer system as built diagram iii. Identify company data security protection method iv. Select network security control tools v. Estimate company resources to implement computer system security control vi. Prepare work breakdown structure and timeline for computer system security control vii. Define computer system security risks viii. Determine computer system security strategies ix. Prepare computer system logon and authentication policy x. Produce computer sys-		30 hours	Observation, & Project	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		tem security control plan xi. Prepare computer system security checklist and job order	<p><u>Attitude:</u></p> i. Detail in determining computer system security access control ii. Accurate in estimating company resources to implement computer system security control			
3. Administer computer system security	i. Physical security system deployment: <ul style="list-style-type: none"> <li>• Installation</li> <li>• Configuration</li> <li>• Testing:               <ul style="list-style-type: none"> <li>- Functionality</li> <li>- operational test</li> </ul> </li> <li>• Product training</li> <li>• Hand-over</li> </ul>			40 hours	Lecture, group discussion, case study	i. Skills and competency level in computer physical system security deployment, computer system maintenance and security back-up identified and lis-

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>ii. Computer system maintenance tasks:               <ul style="list-style-type: none"> <li>• Preventive maintenance</li> <li>• Corrective maintenance</li> </ul> </li> <li>iii. Back-up agents installation</li> <li>iv. Computer system security back-up:               <ul style="list-style-type: none"> <li>• CCTV video back-up</li> <li>• Door access log back-up</li> </ul> </li> <li>v. Computer system security configuration:               <ul style="list-style-type: none"> <li>• User access</li> <li>• Access list / filters</li> <li>• Firewall</li> <li>• Account policies</li> <li>• Local policies</li> <li>• Event log</li> <li>• Restricted groups</li> <li>• System services</li> <li>• Registry</li> <li>• File system</li> </ul> </li> <li>vi. Computer system security operation status:               <ul style="list-style-type: none"> <li>• Log status</li> <li>• Uptime</li> </ul> </li> </ul>					<p>ted out</p> <ul style="list-style-type: none"> <li>ii. Physical system security deployment tasks listed out and interpreted</li> <li>iii. Computer system maintenance tasks listed and performed</li> <li>iv. Computer system security back-up tasks listed out and executed</li> <li>v. Job order variance in physical system security deployment, computer system maintenance and security back-up job reviewed and rectified</li> <li>vi. Computer system security configuration performed and configuration manual produced</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• System alert</li> </ul> vii. Effectiveness of computer system security control evaluation  viii. Managerial skills: <ul style="list-style-type: none"> <li>• Delegation</li> <li>• monitoring</li> <li>• Coaching</li> <li>• Coordinating</li> </ul>					vii. Computer system security operation status assessed and assessment result recorded  viii. Effectiveness of computer system security control evaluated and security checklist produced
		i. Identify subordinate skills and competency level in computer physical system security deployment, computer system maintenance and security back-up  ii. Delegate and supervise subordinate to execute physical system security deployment, computer system maintenance and security back-up.  iii. Review and rectify system security deployment, computer system maintenance and security back-up job order variance  iv. Perform computer sys-		60 hours	Observation, & Project	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		tem security configuration  v. Asses computer system security operation status  vi. Evaluate effectiveness of computer system security control according to security checklist	<u>Attitude:</u> i. Meticulous in performing computer system security configuration ii. Systematic in managing physical security system deployment iii. Precise in assessing computer system security operation status iv. Detail in evaluating effectiveness of computer system security control  <u>Safety/Environment:</u> i. Adhere to computer system security standard and company pro-			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
			cedure			
4. Produce computer system security control report	i. Report writing ii. Document management system <ul style="list-style-type: none"> <li>• Coding: naming convention</li> <li>• Recording</li> <li>• Filing</li> <li>• Document safety</li> <li>• Confidentiality</li> </ul> iii. Job variance analysis report <ul style="list-style-type: none"> <li>• Issues /problem</li> <li>• Root cause</li> <li>• Solution</li> </ul> iv. Computer system security configuration manual v. Evaluation report of computer system security control effectiveness vi. Computer system security control report <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Work schedule</li> <li>• Computer system security checklist</li> </ul>			5 hours	Lecture & case study	i. Job variance analysis report prepared ii. Computer system security configuration manual developed iii. Computer system security control effectiveness evaluated and report produced iv. Computer system security control report produced: <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Work schedule</li> <li>• Computer system security checklist</li> <li>• Security strategies</li> <li>• Job execution details:               <ul style="list-style-type: none"> <li>- Physical system security deployment,</li> <li>- computer</li> </ul> </li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Security strategies</li> <li>• Job execution details:               <ul style="list-style-type: none"> <li>- Physical system security deployment,</li> <li>- computer system maintenance</li> <li>- security back-up</li> <li>- security configuration</li> </ul> </li> <li>• Security risks</li> <li>• Expenses report</li> <li>• Other matters / issues related to security</li> </ul> <p>vii. Compilation of computer system security control documents:</p> <ul style="list-style-type: none"> <li>• CCTV installation document</li> <li>• Door access security</li> <li>• Configuration information</li> <li>• Warranty card</li> <li>• Back-up document</li> <li>• Etc.</li> </ul>					<p>system maintenance</p> <ul style="list-style-type: none"> <li>- security back-up</li> <li>- security configuration</li> </ul> <ul style="list-style-type: none"> <li>• Security risks</li> <li>• Expenses report</li> </ul> <p>⦿. Computer system security control documents compiled and archived in accordance with document management system</p>
		<p>i. Prepare job variance analysis report on</p> <p>ii. Develop computer system security configuration manual</p> <p>iii. Produce computer sys-</p>		9 hours	Coaching & Project	



Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		<p>tem security control effectiveness evaluation report</p> <p>iv. Prepare computer system security control report</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Work schedule</li> <li>• Computer system security checklist</li> <li>• Security strategies</li> <li>• Job execution details: <ul style="list-style-type: none"> <li>- Physical system security deployment,</li> <li>- computer system maintenance</li> <li>- security back-up</li> <li>- security configuration</li> </ul> </li> <li>• Security risks</li> <li>• Expenses</li> <li>• Other matters / issues related to security</li> </ul> <p>v. Carry out computer system security control documentation</p>	<p><u>Attitude:</u></p> <p>i. Systematic in compiling computer system security documents</p> <p>ii. Detail in writing</p>			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
			security configuration manual iii. Precise and transparent in producing computer system security control report  <u>Safety/Environment.</u> i. Adhere to document confidentiality and safety policy			

### Employability Skills

Core Abilities	Social Skills
04.08 Develop and negotiate staffing plans 04.09 Prepare project/work plans 04.10 Utilize science and technology to achieve goals 05.03 Allocate and record usage of financial and physical resources 05.04 Delegate responsibilities and/or authority	1. Teamwork 2. Learning skill 3. Self-discipline 4. Leadership skill

Core Abilities	Social Skills
05.05 Coordinates contract and tender activities 06.08 Identify and analyze effect of technology on the environment	5. Conceptual skills 6. Interpersonal skills 7. Communication skills 8. Multitasking and prioritizing

### Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1) LCD Projector	1:25
2) Server	1:25
3) Firewall	1:25
4) Computer / laptop	1:1
5) ISO/IEC 17799:2005	1:1
6) ISO/IEC 27002	1:1
7) Malaysia Cyber law: Computer Crime Act 1997	1:1
8) Sample of Company Computer System Security SOP	1:1
9) Sample of door access log	1:1
10) Sample of CCTV log	1:1
11) EMS (Environment Monitoring System)	1:1
12) Software	1:1
13) Anti-virus	1:1
14) Sample of warrant card	1:1
15) Sample of security control report	1:1
16) Sample of Job order	1:1
17) Sample of Work Breakdown Structure	1:1

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## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	<b>INFRASTRUCTURE SUPPORT</b>								
<b>Job Area</b>	<b>COMPUTER SYSTEM ADMINISTRATION</b>								
<b>Competency Unit Title</b>	<b>COMPUTER SYSTEM MAINTENANCE MANAGEMENT</b>								
<b>Learning Outcome</b>	<p>The person who is competent in this CU shall be able to manage preventive and corrective maintenance of computer system to ensure good condition of computer system to meet users' requirement. Upon completion of this competency unit, trainees will be able to: -</p> <ul style="list-style-type: none"> <li>• Analyse computer system maintenance requirements</li> <li>• Develop computer system maintenance plan</li> <li>• Manage computer system maintenance work</li> <li>• Manage computer system troubleshooting issues/ failures</li> <li>• Produce computer system maintenance management report.</li> </ul>								
<b>Competency Unit ID</b>	4	<b>Competency Type</b>	Core	<b>Level</b>	4	<b>Training Duration</b>	200 Hours	<b>Credit Hours</b>	20
<b>Work Activities</b>	<b>Related Knowledge</b>	<b>Related Skills</b>		<b>Attitude / Safety / Environmental</b>		<b>Training Hour</b>	<b>Delivery Mode</b>	<b>Assessment Criteria</b>	
1. Analyse computer system maintenance requirements	i. ISO/IEC: 8648:1988 (Interconnection- internal organisation of the network layer )  ii. Company policy : <ul style="list-style-type: none"> <li>• Computer system maintenance SOP</li> <li>• Computer system security SOP</li> </ul> iii. Computer system maintenance documents: <ul style="list-style-type: none"> <li>• Previous</li> </ul>					15 hours	Lecture, Case study, problem based learning	i. Computer system network diagram interpreted  ii. Previous maintenance report analysed  iii. Computer system risk and business impact evaluated  iv. Users' feed-	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<p style="padding-left: 20px;">maintenance report</p> <ul style="list-style-type: none"> <li>• Vendor service manual</li> <li>• SLA</li> </ul> <p>iv. Computer network layout/diagram</p> <ul style="list-style-type: none"> <li>• Main distribution frame</li> <li>• ISP</li> <li>• Types of cable (by colour code)</li> <li>• Types of network (LAN, WAN, MAN, CAN)</li> </ul> <p>v. User's feedback on network performance</p> <p>vi. Computer system risk and impact analysis</p> <ul style="list-style-type: none"> <li>• Hardware failure</li> <li>• Software failure</li> <li>• Security threat</li> <li>• Business continuity impact</li> <li>• Users safety and handling risk</li> <li>• Technical staff capability</li> </ul>					<p>back on computer system performance assessed</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> <li>i. Interpret computer system network diagram</li> <li>ii. Analyse previous maintenance report</li> <li>iii. Evaluate computer system risk and business impact</li> <li>iv. Assess users' feedback on computer system performance</li> </ul>	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> <li>i. Details in analysing previous maintenance report</li> <li>ii. Thorough in evaluating risk and business impact</li> </ul> <p><u>Safety/Environment:</u></p> <ul style="list-style-type: none"> <li>i. Adhere to company SOP and computer system standard</li> </ul>	21 hours	Demonstration, observation and scenario based training	
2. Develop computer system maintenance plan	<ul style="list-style-type: none"> <li>i. Company resources related to computer maintenance: <ul style="list-style-type: none"> <li>• budget</li> <li>• skilled staff</li> <li>• tools</li> </ul> </li> <li>ii. Computer system maintenance and</li> </ul>			12 hours	Lecture, group discussion, case study or problem based learning	<ul style="list-style-type: none"> <li>i. Types of computer system maintenance determined</li> <li>ii. Resource requirement related to com-</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<p>troubleshooting tools</p> <ul style="list-style-type: none"> <li>• Hardware tools <ul style="list-style-type: none"> <li>- electrical/ electronic test instruments;</li> <li>- monitoring devices;</li> <li>- screwdrivers, pliers, torch</li> </ul> </li> <li>• Software tools <ul style="list-style-type: none"> <li>- diagnostics eg virus software; test utilities;</li> <li>- monitoring programs, error logging programs, system specific applications</li> </ul> </li> </ul> <p>iii. Computer system maintenance time</p> <ul style="list-style-type: none"> <li>• Destructive</li> <li>• Non destructive</li> </ul> <p>iv. Computer system maintenance announcement and trouble ticket</p> <p>v. Computer network maintenance management plan content</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Timeline</li> </ul>					<p>puter system maintenance estimated</p> <p>iii. Computer system maintenance and troubleshoot tools selected</p> <p>iv. Maintenance tasks and work breakdown structure determined and listed out</p> <p>v. Computer system maintenance management plan prepared</p> <p>vi. Computer system maintenance checklist and job order produced</p>



Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Maintenance schedule</li> <li>• Job checklist</li> <li>• Manpower</li> <li>• Gantt chart</li> <li>• Maintenance cost</li> </ul> <p>vi. Computer system asset inventory record</p> <p>vii. Technical writing skills</p> <p>viii. Presentation skills</p>					
		<p>i. Determine types of computer system maintenance</p> <p>ii. Estimate resource requirement related to computer system maintenance</p> <p>iii. Select computer system maintenance and troubleshoot tools</p> <p>iv. Determine maintenance tasks and work breakdown structure</p> <p>v. Prepare computer system maintenance management plan and present to superior</p> <p>vi. Prepare computer network maintenance checklist and job order</p>		18 hours	Project and scenario based training	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
			<p><u>Attitude:</u></p> <ul style="list-style-type: none"> <li>i. Accurate in estimating resource requirement for computer system maintenance</li> <li>ii. Analytical mind when evaluating computer system risk and business impact</li> </ul> <p><u>Safety/Environment:</u></p> <ul style="list-style-type: none"> <li>i. Adhere to company SOP</li> </ul>			
<p>3. Manage computer system maintenance work</p>	<ul style="list-style-type: none"> <li>i. Types of computer system maintenance <ul style="list-style-type: none"> <li>• Preventive</li> <li>• Corrective</li> <li>• Predictive</li> </ul> </li> <li>ii. Computer system maintenance procedure <ul style="list-style-type: none"> <li>• Failure identification</li> <li>• Acquire permission to perform unscheduled maintenance</li> </ul> </li> <li>iii. Computer system maintenance process <ul style="list-style-type: none"> <li>• Repair cost-benefit</li> </ul> </li> </ul>			32 hours	Lecture, group discussion, case study or problem based learning	<ul style="list-style-type: none"> <li>i. Subordinate skills and competency level in computer system maintenance identified</li> <li>ii. Computer system maintenance task (preventive and corrective) listed out</li> <li>iii. Computer system maintenance report</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>analysis</li> <li>• Procurement handling</li> <li>• Warranty checking</li> <li>• Vendor agreement management</li> <li>• Disposal</li> </ul> <p>iv. Computer system support service</p> <ul style="list-style-type: none"> <li>• Level of support service <ul style="list-style-type: none"> <li>- 3rd Level</li> <li>- 2nd Level</li> <li>- 1st Level</li> </ul> </li> <li>• User's feedbacks and complaints handling <ul style="list-style-type: none"> <li>- Collection of user's feedback medium</li> <li>- User's feedback analysis</li> <li>- Identification of root cause</li> <li>- Action plan</li> <li>- Action performed</li> </ul> </li> </ul> <p>v. Quality improvement technique, such as:</p> <ul style="list-style-type: none"> <li>• Process mapping</li> <li>• Brain storming</li> <li>• Cost and effect analysis</li> </ul>					<p>analysed</p> <p>iv. computer system maintenance job order variance reviewed and rectified</p> <p>v. Computer system part repair or replacement requisition verified and approved</p> <p>vi. Computer system part or component purchasing requisition prepared</p> <p>vii. Procurement task carried out</p> <p>viii. Computer system maintenance expenses controlled</p> <p>ix. Computer system support service quality and user's feedback evalu-</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	vi. Managerial skill: <ul style="list-style-type: none"> <li>• Delegation</li> <li>• Monitoring</li> <li>• Supervision</li> <li>• Coordinating</li> </ul>					ated x. Computer system threat and risks managed xi. Computer system maintenance service quality assessed
		i. Identify subordinate skills and competency level in computer system maintenance ii. Delegate and supervise subordinate for computer system maintenance task (preventive and corrective) and monitor work progress iii. Analyse computer system maintenance report iv. Review and rectify computer system maintenance job order variance v. Verify and approve computer system part repair or replacement requisition vi. Prepare computer system part or component purchasing requisition and present to superior for approval vii. Carry out procurement task viii. Control computer system maintenance ex-		48 hours	Demonstration, Project and scenario based training	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		<p>penses</p> <ul style="list-style-type: none"> <li>ix. Evaluate computer system support service quality and user's feedback</li> <li>x. Manage computer system threat and risks</li> <li>xi. Assess computer system maintenance service quality</li> </ul>	<p><i>Attitude:</i></p> <ul style="list-style-type: none"> <li>i. Analytical mind in assessing server maintenance report</li> <li>ii. Accurate in rectifying job order variance</li> <li>iii. Cost conscious when estimate maintenance cost</li> </ul> <p><i>Safety/Environment</i></p> <ul style="list-style-type: none"> <li>i. Adhere to Manufacturer operating manual</li> <li>ii. Adhere to company server security procedure</li> </ul>			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
			iii. Adhere to disposal procedure			
4. Manage computer system troubleshooting issues/ failures	i. Computer system problems: <ul style="list-style-type: none"> <li>• Hardware failure               <ul style="list-style-type: none"> <li>- failed components</li> <li>- unsecured plugged in device</li> </ul> </li> <li>• Software issue               <ul style="list-style-type: none"> <li>- Effect of software updates</li> <li>- Software bugs</li> </ul> </li> <li>• User-created problem               <ul style="list-style-type: none"> <li>- user inadvertently change settings</li> </ul> </li> <li>• system performance issues               <ul style="list-style-type: none"> <li>- Disk Defragmenter</li> <li>- Drivers</li> <li>- Memory</li> <li>- Running processes</li> </ul> </li> </ul> ii. Analyze symptoms <ul style="list-style-type: none"> <li>• Hardware tools and techniques:               <ul style="list-style-type: none"> <li>- Electrical/ electronic test instruments;</li> <li>- Self-test routines;</li> <li>- Monitoring</li> </ul> </li> </ul>			16 hours	Lecture, group discussion, case study / problem based learning	i. Computer system problems analysed ii. Computer system problem diagnosed and symptom interpreted iii. Troubleshooting executed iv. Remedy identifies and perform to solve problem

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<p>devices;</p> <ul style="list-style-type: none"> <li>- Tools eg screw-drivers, pliers, torch</li> </ul> <ul style="list-style-type: none"> <li>• Software tools and techniques: <ul style="list-style-type: none"> <li>- Diagnostics eg virus software; test utilities;</li> <li>- Monitoring programs,</li> <li>- Error logging programs,</li> <li>- System specific applications</li> </ul> </li> <li>• Troubleshooting: techniques: <ul style="list-style-type: none"> <li>- Substitution,</li> <li>- Testing</li> <li>- Part change / replace</li> <li>- Upgrading</li> <li>- Software re-installation</li> <li>- Elimination,</li> <li>- Bug fixe application</li> <li>- Error codes generating</li> </ul> </li> </ul> <p>iii. Remedies execution venue:</p> <ul style="list-style-type: none"> <li>• off-site</li> <li>• on-site</li> </ul>					

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<p>iv. Remedies identification source :</p> <ul style="list-style-type: none"> <li>• knowledge data-bases,</li> <li>• technical manuals,</li> <li>• internet FAQs,</li> <li>• manufacturers' web-sites</li> <li>• fault history</li> </ul> <p>v. Types of remedies:</p> <ul style="list-style-type: none"> <li>• Hardware repair or replace</li> <li>• Fix of communication paths</li> <li>• Software reconfiguration</li> <li>• Software patches application</li> <li>• Software reinstallation</li> </ul> <p>vi. Computer system troubleshooting procedure</p> <ul style="list-style-type: none"> <li>• obtaining permissions</li> <li>• recording information <ul style="list-style-type: none"> <li>- product keys,</li> <li>- license number,</li> <li>- installation date;</li> <li>- health and safety practices;</li> <li>- maintain data security and integ-</li> </ul> </li> </ul>					



Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<p>rity</p>	<ul style="list-style-type: none"> <li>i. Analyse computer system problems</li> <li>ii. Diagnose computer system problem and interpret symptom</li> <li>iii. Execute computer system troubleshooting</li> <li>iv. Perform remedy to solve problem</li> </ul>	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> <li>i. Thorough in analysing computer system problem.</li> <li>ii. Analytical mind when diagnose problem</li> <li>iii. Systematic and meticulous in execute troubleshoot</li> </ul> <p><u>Safety/Environment:</u></p> <ul style="list-style-type: none"> <li>i. Care when handling cables</li> <li>ii. Follow manufacturer instruction manual</li> <li>iii. Adhere to security policy</li> </ul>	24 hours	Observation Project, simulation	
6. Produce computer system maintenance management report.	<ul style="list-style-type: none"> <li>i. Report writing</li> <li>ii. Presentation skill</li> <li>iii. Computer system main-</li> </ul>			6 hours	Lecture, group discussion, case study	<ul style="list-style-type: none"> <li>i. Computer system maintenance analysis report produced</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<p>tenance analysis report</p> <ul style="list-style-type: none"> <li>• Issues / problem</li> <li>• root cause analysis</li> <li>• User's feedback summary</li> <li>• Action taken</li> <li>• Recommendation for process improvement</li> </ul> <p>iv. Document management system</p> <ul style="list-style-type: none"> <li>• Coding: naming convention</li> <li>• Recording</li> <li>• Filing</li> <li>• Document safety</li> <li>• Confidentiality</li> </ul> <p>v. Computer system maintenance management report contents:</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and Timeline</li> <li>• Job specification</li> <li>• Job checklist</li> <li>• Network maintenance team members</li> <li>• Job execution details: <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team member involved</li> </ul> </li> </ul>					<ul style="list-style-type: none"> <li>• Issue/problem identified</li> <li>• root cause analysed</li> <li>• User's feedback analysed</li> <li>• Action taken suggested</li> <li>• Recommendation for process improvement established</li> </ul> <p>ii. Computer system maintenance management report produced and executed tasks highlighted</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and timeline</li> <li>• Job checklist</li> <li>• computer system maintenance team members</li> <li>• Job execution details: <ul style="list-style-type: none"> <li>- Date &amp; time</li> </ul> </li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>- Job variance</li> <li>- Rectification</li> <li>• Maintenance expenses</li> <li>• Other matters / issues related to network maintenance</li> </ul>					<ul style="list-style-type: none"> <li>- Team members involved</li> <li>- Job variance</li> <li>- Rectification</li> <li>• Maintenance expenses</li> </ul>
		<ul style="list-style-type: none"> <li>i. Prepare computer system maintenance analysis report               <ul style="list-style-type: none"> <li>• computer system performance status</li> <li>• Maintenance work</li> <li>• Suggestion for next maintenance</li> <li>• Suggestion for improvement</li> </ul> </li> <li>ii. Prepare computer system maintenance analysis report</li> <li>iii. Produce computer system maintenance management report and highlight executed tasks               <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and timeline</li> <li>• Job checklist</li> <li>• computer system</li> </ul> </li> </ul>		8 hours	Coaching & Project	<ul style="list-style-type: none"> <li>iii. Computer maintenance related documents compiled, filed and archived according to document management system</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		<p>maintenance team members</p> <ul style="list-style-type: none"> <li>• Job execution details: <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team members involved</li> <li>- Job variance</li> <li>- Rectification</li> </ul> </li> <li>• Maintenance expenses</li> <li>• Other matters / issues related to network maintenance</li> </ul> <p>iv. Compile and file computer maintenance related documents</p>	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> <li>i. Detail and transparent in analysing root cause of computer system problem</li> <li>ii. Detail in preparing maintenance report</li> </ul> <p><u>Safety/Environment:</u></p> <ul style="list-style-type: none"> <li>i. Adhere to document confidentiality and safety policy</li> </ul>			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria

### Employability Skills

Core Abilities	Social Skills
04.08 Develop and negotiate staffing plans 04.09 Prepare project/work plans 05.03 Allocate and record usage of financial and physical resources 05.04 Delegate responsibilities and/or authority 06.08 Identify and analyze effect of technology on the environment	1. Teamwork 2. Learning skill 3. Self-discipline 4. Leadership skill 5. Conceptual skills 6. Interpersonal skills 7. Communication skills 8. Multitasking and prioritizing

### Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)

1) LCD Projector	1:25
2) Computer / laptop	1:25
3) Repair toolkit (screw drivers, pliers, test pen, etc)	1:5
4) Equipment operating manuals	1:1
5) Equipment service manuals	1:1
6) Multimeter	1:5
7) Operating system recovery disc	1:5
8) Device drivers disc	1:5
9) External USB Hard disk connector	1:5
10) Data backup software	1:5
11) Cleaning kit (brush, cleaning solution, etc)	1:25
12) Network cable tester	1:5
13) Thermal paste	1:1
14) Sample of computer system asset inventory	1:1
15) Sample of SLA	1:1
16) Sample of vendor service manual	1:1
17) Sample of computer maintenance checklist	1:1
18) Sample of computer system maintenance plan	1:1
19) Sample of maintenance management report	1:1
20) Sample of fault analysis report	

**REFERENCES**

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2. [Jyoti Snehi](#). (2006). [Computer Peripherals and Interfacing](#). Firewall Media. ISBN-13: 978-81-7008-929-2
3. [R.A. Penfold](#). (2005). [How to Set Up Your New Computer](#). Bernard Babani Publishing  
ISBN-13: 978-0-85934-559-0
4. [Robert B J Warnar](#) (2012). [Computer Peripheral Memory System Forecast \(Volume 500-545\)](#). General Books. ISBN-13: 978-1-235-71266-1

## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	<b>INFRASTRUCTURE SUPPORT</b>								
<b>Job Area</b>	<b>COMPUTER SYSTEM ADMINISTRATION</b>								
<b>Competency Unit Title</b>	<b>COMPUTER SYSTEM AND NETWORK PROCUREMENT</b>								
<b>Learning Outcome</b>	<p>The person who is competent in this CU shall be able to provide technical input to purchasing department to expedite the purchasing process and to ensure purchased item fulfil company requirements. Upon completion of this competency unit, trainees will be able to:</p> <ul style="list-style-type: none"> <li>• Analyse computer system and network requirements</li> <li>• Carry out procurement activities</li> <li>• Administer computer system and network products/ items receiving</li> <li>• Report the new products/ items receiving to the related department</li> </ul>								
<b>Competency Unit ID</b>	5	<b>Competency Type</b>	Core	<b>Level</b>	4	<b>Training Duration</b>	140 Hours	<b>Credit Hours</b>	14
<b>Work Activities</b>	<b>Related Knowledge</b>	<b>Related Skills</b>		<b>Attitude / Safety / Environmental</b>		<b>Training Hour</b>	<b>Delivery Mode</b>	<b>Assessment Criteria</b>	
1. Analyse computer system and network requirements	i. Computer system and network technology evolution <ul style="list-style-type: none"> <li>• Cloud technology</li> <li>• Mobile computing</li> </ul> ii. Company purchasing and procurement procedure <ul style="list-style-type: none"> <li>• Purchase requisition (PR)</li> <li>• Capital Expenditure (CAPEX)</li> </ul> iii. Computer system and peripherals, such as:					10 hours	Lecture, Case study/ problem based learning	i. Computer system and network technology evaluated  ii. Computer system inventory status assessed  iii. Feasibility study carried out and technical specification, budget & manpower de-	



Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Computer peripherals: <ul style="list-style-type: none"> <li>- Scanner</li> <li>- Printer</li> <li>- Fax</li> <li>- Multifunction machine</li> <li>- Mobile devices</li> </ul> </li> <li>• Main distribution frame <ul style="list-style-type: none"> <li>- router</li> <li>- firewall</li> <li>- switch</li> <li>- server</li> </ul> </li> <li>• network cables</li> </ul>					<p>terminated</p> <p>iv. Product /item specification prepared</p>
		<ol style="list-style-type: none"> <li>i. Analyse computer system and network requisition form</li> <li>ii. Evaluate computer system and network technology</li> <li>iii. Assess computer system inventory status</li> <li>iv. Carry out feasibility study carried out to determine technical specification, budget and manpower</li> <li>v. Prepare product /item specification and present to committee</li> <li>vi. Secure product /item specification approval</li> </ol>		15 hours	Demonstration, observation and scenario based training	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
			<u>Attitude:</u> i. Thorough in analysing computer system and network requirements  <u>Safety/Environment:</u> i. Adhere to company procedure			
2. Carry out procurement activities	i. Tasks of request for proposal/quotation (RFP/RFQ): <ul style="list-style-type: none"> <li>• Suppliers identification</li> <li>• Quotation requisition from suppliers</li> <li>• RFP/RFQ analysis               <ul style="list-style-type: none"> <li>- Technical specification comparison</li> <li>- Price comparison</li> <li>- Terms and condition of purchasing</li> <li>- Mode of Payment:(Online, COD, Credit terms, Cheque)</li> <li>- Payment terms (40 days, 60 days, 90 days</li> <li>- Validity of</li> </ul> </li> </ul>			25 hours	Lecture & case study / problem based learning	i. Suppliers identified and listed out  ii. Quotation / proposal from suppliers evaluated  iii. Product/item price and contract terms negotiated  iv. RFP/RFQ summary prepared  v. Purchase requisition proposal prepared and presented to

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<p>RFP/RFQ</p> <ul style="list-style-type: none"> <li>• Price negotiation</li> </ul> <p>ii. Purchasing process</p> <ul style="list-style-type: none"> <li>• Purchase requisition proposal</li> <li>• Approval form evaluation committed</li> <li>• Submission of purchase requisition proposal to finance department</li> <li>• Product/item purchased by purchasing department through purchase order to the supplier</li> </ul> <p>iii. Equipment approval authority</p> <ul style="list-style-type: none"> <li>• SIRIM</li> <li>• MCMC</li> </ul> <p>iv. Negotiation technique</p>					evaluation committee for approval
		<p>i. Identify suppliers</p> <p>ii. Evaluate quotation / proposal from suppliers</p> <p>iii. Negotiate product/item price and contract terms</p>		38 hours	Observation, & Project	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		iv. Prepare RFP/RFQ summary and present to the evaluation committee v. Prepare purchase requisition proposal and present to evaluation committee for approval and submit it to finance department for budget approval	<u>Attitude:</u> i. Analytical mind and knowledgeable in executing procurement tasks ii. Detail in analysing RFQ/RFP  <u>Safety/Environment:</u> i. Adhere to company procurement procedure			
3. Administer computer system and network products/ items receiving	i. Supplier delivery order documents <ul style="list-style-type: none"> <li>• Supplier Delivery Order details:               <ul style="list-style-type: none"> <li>- Company Purchase Order number</li> <li>- Part, serial, model number</li> <li>- Equipment / facilities description</li> <li>- Quantity</li> <li>- Supplier details</li> </ul> </li> </ul>			14 hours	Lecture, group discussion, case study / problem based learning	i. Supplier delivery note verified ii. Physical quantity of the item / equipment verified iii. Item / equipment functionality and phys-

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>- Receiver details</li> <li>• Company Purchase Order (P.O) details: <ul style="list-style-type: none"> <li>- P.O number</li> <li>- Quantity</li> <li>- Product name</li> </ul> </li> <li>ii. Item / equipment functionality and physical condition checking procedure: <ul style="list-style-type: none"> <li>• Functionality test <ul style="list-style-type: none"> <li>- Item / equipment operation system functionality</li> <li>- Item / equipment test run</li> </ul> </li> <li>• Item / equipment installation</li> <li>• Physical condition check-up <ul style="list-style-type: none"> <li>- External condition check</li> <li>- Internal condition check</li> </ul> </li> </ul> </li> <li>iii. Tasks of receiving note acknowledgement <ul style="list-style-type: none"> <li>• Delivery Order (D.O) verification</li> <li>• Related departments notification through email / memo</li> <li>• Submission of D.O</li> </ul> </li> </ul>					<ul style="list-style-type: none"> <li>ical condition verified</li> <li>iv. Receiving note acknowledged</li> <li>v. Asset tagging and labelling carried out</li> <li>vi. The item is recorded as company asset</li> <li>vii. The item is allocated to the user</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	<p>to account and /or administration department</p> <p>iv. Safety and security requirement:</p> <ul style="list-style-type: none"> <li>• ISO / IEC</li> <li>• Communication and Multimedia Act</li> </ul>					
		<p>i. Monitor delivery of the item / equipment by liaising with purchasing department for the Expected Time Arrival (ETA) of the product/ item</p> <p>ii. Verify the item / equipment upon receiving of the product / item</p> <ul style="list-style-type: none"> <li>• supplier delivery note</li> <li>• physical quantity of the product / item</li> <li>• Item / equipment functionality and physical condition</li> <li>• Acknowledgement of the receiving note</li> </ul> <p>iii. Monitor and supervise asset tagging and labelling</p>		21 hours	Observation Project, simulation	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		iv. Delegate subordinate for recording the item as company asset	<p><u>Attitude:</u></p> i. Firm in monitoring item delivery ii. Accountable in verifying received item/equipment iii. Detail when checking physical quantity of the item / equipment <p><u>Safety/Environment:</u></p> i. Adhere to company procurement procedure ii. Safety conscious when checking and testing item functionality			
4. Report the new products/ items receiving to the related department	i. Report writing ii. Document management system <ul style="list-style-type: none"> <li>• Coding: naming convention</li> <li>• Recording</li> <li>• Filing</li> <li>• Document safety</li> <li>• Confidentiality</li> </ul>			7 hours	Lecture & case study	i. Product/ item documents compiled and file in according with document management system <ul style="list-style-type: none"> <li>• Warranty card endorsed</li> <li>• Licensing</li> </ul>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
	iii. Compilation of product/item documents <ul style="list-style-type: none"> <li>• Warranty</li> <li>• Licensing</li> <li>• Contract terms and conditions</li> <li>• Product/ item maintenance contract</li> </ul> iv. Asset inventory report           v. Procurement report <ul style="list-style-type: none"> <li>• Product/ item information               <ul style="list-style-type: none"> <li>- Name</li> <li>- Specification</li> <li>- Price</li> <li>- Supplier name</li> <li>- Date received</li> </ul> </li> <li>• Placement location / user name</li> <li>• Contract terms               <ul style="list-style-type: none"> <li>- Warranty</li> <li>- Licensing</li> <li>-Service contract / maintenance contract</li> </ul> </li> <li>• Technical training</li> </ul>					endorsed <ul style="list-style-type: none"> <li>• Contract terms and conditions verified</li> <li>• Product/ item maintenance contract validated</li> </ul> ii. Asset inventory report updated           iii. Procurement report prepared <ul style="list-style-type: none"> <li>• Product/ item information</li> <li>• Placement location / user name</li> <li>• Contract terms</li> <li>• Technical training</li> </ul>
		i. Compile and file product/ item related documents		10 hours	Coaching & Project	



Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> <li>• Warranty card</li> <li>• Licensing</li> <li>• Contract terms and conditions</li> <li>• Product/ item maintenance contract</li> </ul> <p>ii. Monitor asset inventory report updating</p> <p>iii. Prepare procurement report and submit to superior and relevant department</p> <ul style="list-style-type: none"> <li>• Product/ item information</li> <li>• Placement location / user name</li> <li>• Contract terms</li> <li>• Technical training</li> </ul>	<p><u>Attitude:</u></p> <p>i. Precise and transparent in preparing report</p> <p>ii. Accountable in compiling and filing procurement documents</p> <p><u>Safety/Environment:</u></p> <p>i. Adhere to document confidential-</p>			

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hour	Delivery Mode	Assessment Criteria
			ity and safety policy			

### Employability Skills

Core Abilities	Social Skills
04.08 Develop and negotiate staffing plans 04.09 Prepare project/work plans 04.10 Utilize science and technology to achieve goals 05.03 Allocate and record usage of financial and physical resources 05.04 Delegate responsibilities and/or authority 05.05 Coordinates contract and tender activities 06.08 Identify and analyze effect of technology on the environment	<ol style="list-style-type: none"> <li>1. Teamwork</li> <li>2. Learning skill</li> <li>3. Self-discipline</li> <li>4. Leadership skill</li> <li>5. Conceptual skills</li> <li>6. Interpersonal skills</li> <li>7. Communication skills</li> <li>8. Multitasking and prioritizing</li> </ol>

### Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1) LCD Projector 2) Computer / laptop 3) Sample of D.O 4) Sample of P.O 5) Sample of Warranty card 6) Sample of asset tag & label 7) Sample of purchasing contract / Term and condition 8) Sample of purchase requisition form / Capital expenditure form	1:25 1:1 1:1 1:1 1:1 1:1 1:1

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## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	<b>INFRASTRUCTURE SUPPORT</b>								
<b>Job Area</b>	<b>COMPUTER SYSTEM ADMINISTRATION</b>								
<b>Competency Unit Title</b>	<b>NETWORK CABLING MANAGEMENT</b>								
<b>Learning Outcome</b>	<p>The person who is competent in this CU shall be able to manage network cable installation which involve selection and installation of cable from main distribution frame to the server according to network topology. Upon completion of this competency unit, trainees will be able to: -</p> <ul style="list-style-type: none"> <li>• Analyse network cabling requirements</li> <li>• Plan network cabling</li> <li>• Manage network cable installation work</li> <li>• Produce network cabling management report</li> </ul>								
<b>Competency Unit ID</b>	6	<b>Competency Type</b>	Elective	<b>Level</b>	4	<b>Training Duration</b>	200 Hours	<b>Credit Hours</b>	20
<b>Work Activities</b>	<b>Related Knowledge</b>	<b>Related Skills</b>		<b>Attitude / Safety / Environmental</b>		<b>Training Hours</b>	<b>Delivery Mode</b>	<b>Assessment Criteria</b>	
1. Analyse network cabling requirements	i. Company policy related to computer network security  ii. Service Level Agreement (SLA)  iii. Vendor service manual  iv. Types of network topology <ul style="list-style-type: none"> <li>• Star</li> <li>• Bus</li> <li>• Mesh</li> </ul>					9 hours	Lecture, Case study, problem based learning	i. Company policy related to network security analysed and security checklist prepared  ii. Types of network topology identified  iii. Cable layout plan interpreted	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Hybrid</li> <li>• Ring</li> <li>• Tree</li> <li>• One-to-one</li> <li>• Hierarchical</li> <li>• Client-server</li> <li>• Multiple nodes</li> </ul> <p>v. Cable layout plan:</p> <ul style="list-style-type: none"> <li>• Point to point distance</li> <li>• Trunking</li> <li>• Horizontal cabling</li> <li>• Backbone cabling</li> <li>• Campus cabling</li> </ul> <p>vi. Types of network cable:</p> <ul style="list-style-type: none"> <li>• Category 5 <ul style="list-style-type: none"> <li>- UTP (Unshielded Twisted Pair)</li> <li>- STP (Shielded Twisted Pair)</li> </ul> </li> <li>• Category 6 <ul style="list-style-type: none"> <li>- UTP (Unshielded Twisted Pair)</li> <li>- STP (Shielded Twisted Pair)</li> </ul> </li> <li>• Fibre optic</li> <li>• Coaxial cable</li> </ul> <p>vii. Cabling time</p> <ul style="list-style-type: none"> <li>• Interruptive</li> </ul>					<p>iv. Computer network cabling dimension / architecture specification identified</p> <p>v. Computer network characteristic, category and cable distance determined</p> <p>vi. Network cabling installation schedule determined</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>Non Interruptive</li> </ul>					
		<ul style="list-style-type: none"> <li>i. Assess network topology</li> <li>ii. Interpret cable layout plan</li> <li>iii. Identify computer network cabling dimension / architecture specification</li> <li>iv. Determine computer network characteristic, category and cable distance</li> <li>v. Determine network cabling installation schedule</li> </ul>	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> <li>i. Detail and precise in interpreting cable layout plan</li> <li>i. Precise in defining network topology</li> <li>ii. Detail and precise in selecting network cable</li> </ul> <p><u>Safety/Environment:</u></p> <ul style="list-style-type: none"> <li>i. Adhere to company safety policy</li> </ul>	21 hours	Demonstration, observation and scenario based training	
2. Plan network cabling	i. Network cabling site survey			18 hours	Lecture, Case study,	i. Network

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Number of runs identification</li> <li>• Floor / ceiling distance</li> <li>• Cable Tray</li> <li>• Raised Floor</li> <li>• Conduit</li> <li>• Hung Ceiling / False Ceiling</li> </ul> <p>ii. Network cable installation tools, equipment and materials</p> <ul style="list-style-type: none"> <li>• Equipment <ul style="list-style-type: none"> <li>- Main distribution frame <ul style="list-style-type: none"> <li>○ Switch</li> <li>○ Router</li> <li>○ Access Point</li> </ul> </li> <li>- Patch panel</li> <li>- Patch cord</li> <li>- RJ 45 Faceplate</li> <li>- Network cable tester</li> <li>- Labelling equipment</li> </ul> </li> <li>• Tools <ul style="list-style-type: none"> <li>- Cable Stripper</li> <li>- Pliers</li> <li>- Crimping tools</li> <li>- Punch Down Tool</li> </ul> </li> </ul>				problem based learning	<p>cabling requirement checklist prepared</p> <p>iii. Resources requirement related to network cabling estimated</p> <p>iii. Network cabling tools, equipment and materials selected</p> <p>iv. Work breakdown structure prepared</p> <p>v. Network cabling management plan produced</p> <p>vi. Network cabling checklist and job order prepared</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>- Screw Drivers</li> <li>- Wire Cutter</li> <li>- Ladder</li>   <li>• Materials <ul style="list-style-type: none"> <li>- Trunking / Conduit</li> <li>- Rubber boot</li> </ul> </li>   <li>ii. Network cabling management plan <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Timeline</li> <li>• Schedule</li> <li>• Job checklist</li> <li>• Manpower</li> <li>• Gantt chart</li> <li>• Maintenance cost</li> </ul> </li>   <li>iv. Network cabling job order content <ul style="list-style-type: none"> <li>• Job specification</li> <li>• Job checklist</li> <li>• Timeline/ schedule</li> <li>• Subordinate name</li> </ul> </li> </ul>					
		<ul style="list-style-type: none"> <li>i. Evaluate network cabling requirement</li> <li>ii. Estimate resources requirement related to network cabling</li> <li>iii. Select network cabling</li> </ul>		42 hours	Observation, & Project	



Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		tools, equipment and materials iv. Prepare work break-down structure v. Produced network cabling management plan vi. Prepare network cabling checklist and job order	<u>Attitude:</u> i. Accurate in estimating resources requirement related to network cabling ii. Precise in preparing work break-down structure and schedule  <u>Safety/Environment:</u> ii. Adhere to company safety policy			
3. Manage network cable installation work	i. Network cable installation criteria <ul style="list-style-type: none"> <li>• Environmental considerations               <ul style="list-style-type: none"> <li>- Electric power cables</li> <li>- Wet area</li> </ul> </li> <li>• Placement</li> <li>• Span</li> </ul>			30 hours	Lecture, Case study, problem based learning	i. Skills and competency level in network cable installation identified and listed out  ii. Network cable installation

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Local requirement</li> <li>• Existing cable plant</li> </ul> <p>ii. Pre - network cable installation tasks:</p> <ul style="list-style-type: none"> <li>• Cable labelling</li> <li>• Trunking / conduit fitting</li> <li>• Placing and fixing faceplate outlet box</li> </ul> <p>iii. Network cable laying and pulling</p> <ul style="list-style-type: none"> <li>• Cable pulling and fishing</li> <li>• Cable sorting</li> <li>• Fixing of cable into trunking / conduit</li> </ul> <p>iv. Network cable termination</p> <ul style="list-style-type: none"> <li>• Cutting</li> <li>• Inserting of UTP cable into RJ45 Jack</li> <li>• Mounting RJ 45 jacks</li> <li>• Crimping</li> <li>• Face plate fixing</li> <li>• Punching</li> <li>• Making connections</li> </ul> <p>Steps</p> <ul style="list-style-type: none"> <li>- Strip cable end</li> <li>- Untwist wire</li> </ul>					<p>tasks listed out and interpreted</p> <p>iii. Network cable installation report analysed</p> <p>iv. Network cable installation job order variance reviewed and rectified</p> <p>v. Monitor network cable installation expenses</p> <p>vi. User Acceptance Test result analysed</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>ends</li> <li>- Arrange wires</li> <li>- Trim wires to size</li> <li>- Attach connector</li> <li>- Check</li> <li>- Crimp</li> <li>- Testing</li> </ul> <p>v. Network cable connection</p> <ul style="list-style-type: none"> <li>• Cable network testing</li> <li>• Connection of cable between main distribution frame to computer system</li> </ul> <p>vi. Network cable connectivity test</p> <ul style="list-style-type: none"> <li>• Remote Test</li> <li>• Ping Test</li> <li>• Network Speed Test</li> </ul> <p>vii. Network cable management</p> <ul style="list-style-type: none"> <li>• labelling - unique identifier</li> <li>• Fastening</li> </ul> <p>viii. Network User Acceptance Test (UAT)</p> <p>ix. Network cable installa-</p>					

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	tion expenses	<ul style="list-style-type: none"> <li>i. Identify subordinate skills and competency level in network cable installation</li> <li>ii. Delegate and supervise subordinate for network cable installation tasks and monitor work progress <ul style="list-style-type: none"> <li>• Network cable laying and pulling</li> <li>• Network cable termination</li> <li>• Network cable connection</li> <li>• Network cable connectivity test</li> <li>• Network cable management</li> </ul> </li> <li>iii. Analyse network cable installation job report</li> <li>iv. Review and rectify server maintenance job order variance</li> <li>v. Monitor network cable installation expenses</li> <li>vi. Analyse User Acceptance Test result</li> </ul>	<p><i>Attitude:</i></p> <ul style="list-style-type: none"> <li>i. Analytical mind in assessing</li> </ul>	70 hours	Observation, & Project	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			network cable installation report ii. Accurate in rectifying job order variance iii. Cost conscious when monitor expenses  <u>Safety/Environment</u> i. Adhere to Manufacturer instruction manual ii. Adhere to company server security procedure			
4. Produce network cabling management report	i. Report writing  ii. Job variance analysis report <ul style="list-style-type: none"> <li>• Issues /problem</li> <li>• Root cause</li> <li>• Solution</li> </ul> iii. UAT result analysis report  iv. Document management system <ul style="list-style-type: none"> <li>• Coding: naming convention</li> <li>• Recording</li> <li>• Filing</li> </ul>			3 hours	Lecture & case study	i. Network cable installation job variance analysis report produced <ul style="list-style-type: none"> <li>• Issues /problem identified</li> <li>• Root cause analysed</li> <li>• Solution proposed</li> </ul> ii. UAT result analysis report prepared

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Document safety</li> <li>• Confidentiality</li> </ul> v. Network cabling management report contents: <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and Timeline</li> <li>• Job specification</li> <li>• Job checklist</li> <li>• Cable installation team members</li> <li>• Job execution details:               <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team members involved</li> <li>- Job variance</li> <li>- Rectification</li> </ul> </li> <li>• Expenses</li> <li>• Other matters / issues related to server maintenance</li> </ul>					iii. Network cabling management report produced and executed tasks highlighted <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and Timeline</li> <li>• Job specification</li> <li>• Job checklist</li> <li>• Cable installation team members</li> <li>• Job execution details:               <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team members involved</li> <li>- Job variance</li> <li>- Rectification</li> </ul> </li> <li>• Expenses</li> <li>• Other matters / issues related to server maintenance</li> </ul>
		i. Produce job variance analysis report <ul style="list-style-type: none"> <li>• Issues /problem</li> <li>• Root cause</li> <li>• Solution taken</li> </ul> ii. Prepare UAT result analysis report		7 hours	Coaching & Project	

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>iii. Produce network cabling management report and highlight executed tasks</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Schedule and Timeline</li> <li>• Job specification</li> <li>• Job checklist</li> <li>• Cable installation team members</li> <li>• Job execution details: <ul style="list-style-type: none"> <li>- Date &amp; time</li> <li>- Team members involved</li> <li>- Job variance</li> <li>- Rectification</li> </ul> </li> <li>• Expenses</li> <li>• Other matters / issues related to server maintenance</li> </ul> <p>iv. Compile and file network cabling management related documents</p>	<p><u>Attitude:</u></p> <p>i. Detail when analyse network cable job variance</p> <p>ii. Accurate and</p>			<p>iv. Network cabling management related documents compiled and filed according to document management system</p>

Work Activities	Related Knowledge	Related Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			transparent in preparing report  <u>Safety/Environment:</u> i. Adhere to document confidentiality and safety policy			

### Employability Skills

Core Abilities	Social Skills
04.08 Develop and negotiate staffing plans 04.09 Prepare project/work plans 05.03 Allocate and record usage of financial and physical resources 05.04 Delegate responsibilities and/or authority 06.08 Identify and analyze effect of technology on the environment	1. Teamwork 2. Learning skill 3. Self-discipline 4. Leadership skill 5. Conceptual skills 6. Interpersonal skills 7. Communication skills





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|--|--|
| <ul style="list-style-type: none"><li>- RJ 45 Universal Key stone Jack</li><li>- Rubber boot</li><li>- RJ 45 connector</li></ul> |  |
|--|--|

## REFERENCES

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