Curriculum For
Computer Network Technician
(Certificate Level- 6 months)
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Overall objective of the course

To prepare the trainees to work as Computer Network Technicians in a wide variety of computer-related industries and has a strong emphasis on Network related problems.

Competencies gained after completion of the course

Knowledge Proficiency Details

- Knowledge of Information technology catering principles and capabilities with particular emphasis on the technical support of local area networks.
- Knowledge in supporting of microcomputer network operating systems with hardware troubleshooting.
- Knowledge of the operational and fault tolerance techniques in networking environment.

Skills Proficiency Details

- Hands on in maintaining all network technologies regarding with local area network in all installation and configuration techniques.
- Perform various tests to detect and remove software malfunctioning through antivirus utilities.
- Apprehend of preparing straight and cross cables through crimping tools set.
- Ability to create different user groups and assigning of different rights and permissions.
- Ability to recover data from damaged disks to ensure data consistency.
- Capable of taking all safety measures to prevent a network from electricity jerk, firing and any sort of damaging conditions.
Job Opportunities available immediately and in future

- Entry-level jobs
- Network supporting technician
- Computer operators
- Installers
- Troubleshooters
- Help desk support
- Network technicians

Curriculum Salient Points

<table>
<thead>
<tr>
<th>Entry-level</th>
<th>SSC/Matric Tech</th>
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<tbody>
<tr>
<td>Duration of Course</td>
<td>6 months</td>
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<tr>
<td>Total Training Hours</td>
<td>800-hours</td>
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<tr>
<td>Training Hours/week</td>
<td>40-Hours per Week (six days a week)</td>
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<tr>
<td>Training Hour a day</td>
<td>7-hours per day (Friday 5 hours)</td>
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<tr>
<td>Training Methodology</td>
<td>20 % Theory</td>
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<tr>
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<td>80 % Practical</td>
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<tr>
<td>Medium of Instruction</td>
<td>English / Urdu</td>
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</table>
### Overview about the program – Curriculum for Computer Network Technician

<table>
<thead>
<tr>
<th>Module Title and Aim</th>
<th>Learning Units</th>
<th>Theory Days/hours</th>
<th>Workplace Days/hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module 1: Fundamentals of IT</strong></td>
<td>LU-1 Introduction to Information Technology</td>
<td>07 Hrs</td>
<td>Nil</td>
</tr>
<tr>
<td>Aim: This module covers the basic elements of Information Technology</td>
<td>LU-2 Introduction to Computer Hardware</td>
<td>14 Hrs</td>
<td>50 Hrs</td>
</tr>
<tr>
<td></td>
<td>LU-3 Introduction to Computer Software</td>
<td>09 Hrs</td>
<td>24 Hrs</td>
</tr>
<tr>
<td><strong>Module 2: Computer Networking</strong></td>
<td>LU-1 Introduction to Computer Network</td>
<td>21 Hrs</td>
<td>30 Hrs</td>
</tr>
<tr>
<td>Aim: This Module will enable the students to understand the basic concept of computer networks, the different types of computer networks/communication and configuration of different network devices.</td>
<td>LU-2 Network fundamentals</td>
<td>11 Hrs</td>
<td>16 Hrs</td>
</tr>
<tr>
<td></td>
<td>LU-3 Transmission Media</td>
<td>14 Hrs</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>LU-4 Types of connectors</td>
<td>04 Hrs</td>
<td>18 Hrs</td>
</tr>
<tr>
<td><strong>Module 3: Client end/window 7</strong></td>
<td>LU-1 Introduction to Operating Systems</td>
<td>03 Hrs</td>
<td>18 Hrs</td>
</tr>
<tr>
<td>Aim: This Module will make the students to understand the Desktop Operating System, the role of Operating System in computing environment, Networking Features in Operating System and will gain hands on practice on Windows 7.</td>
<td>LU-2 Features of Windows 7</td>
<td>03 Hrs</td>
<td>18 Hrs</td>
</tr>
<tr>
<td></td>
<td>LU-3 Administrator Tools</td>
<td>16 Hrs</td>
<td>144 Hrs</td>
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</table>
## Module 4: Connectivity

**Aim:**
This Module will impart the knowledge of understanding the role of OSI Model, TCP/IP Suite and will enable the student to have hands on practice of IP addressing.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU-1</td>
<td>Introduction of OSI Model</td>
<td>10 Hrs</td>
</tr>
<tr>
<td>LU-2</td>
<td>Introduction of TCP/IP Model</td>
<td>8 Hrs</td>
</tr>
<tr>
<td>LU-3</td>
<td>IP Addressing</td>
<td>10 Hrs</td>
</tr>
</tbody>
</table>

## Module 5: Introduction to Windows Server 2008

**Aim:**
This module will enable the students to:
- Understand the role of Server Operating System in Networking Environment
- Create Active Directory Infrastructure Tools
- Understand various administrator tools

<table>
<thead>
<tr>
<th>Unit</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU-1</td>
<td>Introduction to Windows Server 2008</td>
<td>12 Hrs</td>
</tr>
<tr>
<td>LU-2</td>
<td>Features of Windows Server 2008 Environment</td>
<td>11 Hrs</td>
</tr>
</tbody>
</table>

## Module 6: Troubleshooting of a Network

**Aim:**
This module will help the students to understand the troubleshooting methods of connectivity, Window 7 and Windows server 2008.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU-1</td>
<td>Connectivity issues</td>
<td>Nil</td>
</tr>
<tr>
<td>LU-2</td>
<td>Window 7 trouble shooting methods</td>
<td>Nil</td>
</tr>
<tr>
<td>LU-3</td>
<td>Window server 2008 trouble shooting Methods</td>
<td>Nil</td>
</tr>
</tbody>
</table>

**Total hours**
- 160 Hrs
- 640 Hrs
## Computer Networking Technician Curriculum Contents

**Module 1 Title:** Fundamentals of Information Technology  
**Objective of the Module:** This module covers the basic elements of Information Technology  
**Duration:** Total: 104 hours  
**Theory:** 30 hours  
**Practice:** 74 hours

<table>
<thead>
<tr>
<th>Learning Unit</th>
<th>Learning Outcomes</th>
<th>Learning Elements</th>
<th>Duration</th>
<th>Materials Required</th>
<th>Learning Place</th>
</tr>
</thead>
</table>
| LU1- Introduction to Information Technology | Understand computer basics | Theoretically explain the concept of:  
  i. Introduction to Computer  
  ii. Computer History  
  iii. Computer generation  
  iv. Data types, Processing Cycle  
  v. Computer in Real life | 07 Hrs | • Computers  
• Presentations  
• Videos / Demos | Class Room/Lab |
| LU2- Introduction to Computer Hardware | Able to understand and use various components of computers  
Install and configure computer system | Demonstrate and install:  
  i. Input/output Devices (Keyboard, Mouse, Printer, Scanner)  
  ii. CPU (CU, ALU, Cache)  
  iii. Memory and its Type (Primary & Secondary)  
  iv. Portable Devices (Flash Drive, Card Reader, External Drives and other peripherals)  
Demonstrate and assemble:  
  i. Motherboard (Data Cables, Sockets, Ports)  
  ii. Storage devices (Hard Drive, CD/DVD)  
  iii. Cards (NIC, Moded, VGA, Sound etc) | 42 Hrs | • Presentation  
• Computers  
• Demos / Simulation  
• Hardware equipment  
• Tool kits | Class Room/Lab |
| LU3-Introduction to Computer Software | Understand the computer software and types of software | Explain theoretically the concept and use of:  
   i. Software and its Types  
   ii. System Software and its uses  
   iii. Application Software and its uses | 04 Hrs  
   29 Hrs |  
   i. Formatting, Disk Managing & Partitioning  
   ii. Operating System (Windows 7)  
   iii. Anti-Virus  
   iv. Drivers |  
   Presentation manuals  
   Handouts  
   Hardware equipment  
   Tool kits |  
   Computers  
   Presentations  
   Videos / Demos | Class Room/Lab |
**Module 2 Title:** Computer Networking  
**Objective of the Module:** Enable the students to understand the basic concept of computer networks, the different types of computer networks/communication, configuration of different network devices and Creating different network scenarios in a network simulator (packet tracer)  
**Duration:** 158 hours  
**Theory:** 50 hours  
**Practice:** 108 hours

<table>
<thead>
<tr>
<th>Learning Unit</th>
<th>Learning Outcomes</th>
<th>Learning Elements</th>
<th>Duration</th>
<th>Materials Required</th>
<th>Learning Place</th>
</tr>
</thead>
</table>
| LU1-Introduction to Computer Network | Understand the Concept of Network | Briefly describe theoretical concept of:  
i. Computer Networks  
ii. Advantages / Disadvantages of Networks | 04 Hrs | | |
| | Explain Different types of Networks | Explain theoretical concept of:  
i. Local Area Network (LAN)  
ii. Metropolitan Area Network (MAN)  
iii. Wide Area Network (WAN) | 04 Hrs | | |
| | | Explain pros & cons of:  
i. Peer-to-Peer Network  
ii. Server Base Network  
iii. Hybrid Network  
iv. Data, Data rate, Bursty data  
v. Baud rate, Peak data rate  
vi. Bandwidth | 13 Hrs | • Presentations,  
• Videos / Demos  
• Simulations  
• Manuals | Classroom / Lab |
| | | Explain the layout of:  
i. Bus Topology  
ii. Star Topology  
iii. Ring Topology  
iv. Hybrid Topology | 29 Hrs | | |
| LU2- Network fundamentals | Use different Connectivity Devices of Network | Demonstrate & examine use of:  
i. Node, NIC and Modem  
ii. Access point  
iii. Hub (active & Passive) | 71 Hrs | • Presentations,  
• Videos / Demos  
• Simulations  
• Manuals | Classroom / Lab |
| LU3 - Transmission Media | iv. Repeaters & Bridge  
|                        | v. Switch & Router | • Network Equipment |
| Define Transmission    | Explain the use of:|
|                       | i. Simplex        |
|                       | ii. Half duplex   |
|                       | iii. Full duplex  |
| Understand & work     | Describe physical layout of various cables and their usage:|
| on different types    | i. Coaxial cable (10Base2, 10 Base 5, 10Base T, 10BaseFL, 100Base X) |
| of Bounded / Guided   | ii. Twisted Pair Cable (Cat 1, Cat 2, Cat 3, Cat 4, Cat 5, Cat 6) |
| media                | iii. Fiber Optic Cable |
| Understand & work     | Describe unguided media and their uses:|
| on different types    | i. Terrestrial Microwaves |
| of unbounded /       | ii. Radio Waves    |
| unguided media       | iii. Satellite     |
|                     | iv. Wireless Communication |
|                     | 04 Hrs            |

| LU4 - Types of Connectors | Demonstrate and punching of various types of cables / connectors |
|                          | i. RJ-45           |
|                          | ii. RJ-11          |
|                          | iii. BNC           |
|                          | iv. Kevlar(fiber optic) |
|                          | v. DB-9(Serial)    |
|                          | vi. DB-25(Parallel) | 22 Hrs |

- Presentations, Videos / Demos, Simulations
- Cables
- RJ-45
- RJ-11
- BNC
- Kevlar(fiber optic)
- DB-9(Serial)
- DB-25(Parallel)

Classroom / Lab
**Module 3 Title:** Client End/Window 7  
**Objective of the Module:** Enable the students to Understand Desktop Operating System, the role of Operating System in computing environment, Networking Features in Operating System and to attain hands on practice on Windows 7  
**Duration:** 202 hours  
**Theory:** 22 hours  
**Practice:** 180 hours

<table>
<thead>
<tr>
<th>Learning Unit</th>
<th>Learning Outcomes</th>
<th>Learning Elements</th>
<th>Duration</th>
<th>Materials Required</th>
<th>Learning Place</th>
</tr>
</thead>
</table>
| LU1-Introduction to Operating Systems | Understand and Install MS Windows-7 | Demonstrate and install / configure:  
   i. 32 bits and 64 bits OS  
   ii. FAT-16/32, NTFS,  
   iii. Configuration of Disks  
   iv. Preparing Partitions and Volumes  
   v. Configurations of Device Drivers  
   vi. Install / Upgrade / Troubleshoot Operating System | 21 Hrs | - Windows 7 with SP1  
   - Computers  
   - Presentations  
   - Demos / Videos  
   - Manuals | Classroom / Lab |
| LU2-Features of Windows 7 | Understand and manage different types of File/ Folder System, Cryptography and Memory Management | Demonstrate and install / configure:  
   i. NTFS permissions  
   ii. Compress and uncompressed data  
   iii. Data encryption and decryption  
   iv. Memory quota implementation | 21 Hrs | - Windows 7 with SP1  
   - Computers  
   - Presentations  
   - Demos / Videos  
   - Manuals | Classroom / Lab |
| LU3-Administrator Tools | Understand and manage various tasks, utilities, etc. | Demonstrate and manage / configure:  
   i. Component Services  
   ii. System Management  
   iii. User Accounts  
   iv. Event Viewer  
   v. ISCSI Initiator Local Security Policy  
   vi. Performance Monitor  
   vii. Task Scheduler  
   viii. Windows Firewall / Defender  
   ix. Diagnostic Tools  
   x. Network Configuration  
   xi. Remote Desktop Connections  
   xii. Optimizer / Compressor  
   xiii. Backup and Restore | 160 Hrs | - Windows 7 with SP1  
   - Computers  
   - Presentations  
   - Demos / Videos  
   - Manuals | Classroom / Lab |
Module 4 Title: Connectivity

Objective of the Module: Prepare the students to gain hands on practice of IP addressing and understand the role of OSI Model & Understanding of TCP/IP Suite

Duration: 93 hours  Theory: 28 hours  Practice: 65 hours

<table>
<thead>
<tr>
<th>Learning Unit</th>
<th>Learning Outcomes</th>
<th>Learning Elements</th>
<th>Duration</th>
<th>Materials Required</th>
<th>Learning Place</th>
</tr>
</thead>
</table>
| LU1-Introduction of OSI Model | Understand the role of OSI Model Layers in Networking | Explain in detail OSI Model:  
i. Application Layer  
ii. Presentation Layer  
iii. Session Layer  
iv. Transport Layer  
v. Network Layer  
vi. Data-link Layer  
vii. Physical Layer | 10 Hrs | • NICs  
• Modems  
• Access points  
• Hubs  
• ( active & Passive)  
• Repeaters  
• Bridges  
• Switch & Router  
• Computer systems | Classroom / Lab |
| LU2-Introduction of TCP/IP Model | Use TCP/IP Model | Explain in detail TCP/IP Model:  
i. Explain and demonstrate Five Layers overview | 18 Hrs | • Presentation,  
• Simulation  
• Videos | Classroom / Lab |
| LU3-IP Addressing | Define and classify IP Addresses, Use of FLSM and VLSM and Subnet Masking. | Demonstrate and Explain IP Addresses  
i. IPv4 & IPv6  
ii. IP Classes / Range  
iii. Network ID / BID  
iv. FLSM Computation  
v. VLSM Computation  
vi. Subnet Masking | 65 Hrs | • Presentation,  
• Simulation  
• Videos | Classroom / Lab |
**Module 5 Title:** Introduction to Window Server 2008  
**Objective of the Module:** Enable the students to understand the role of Server Operating System in Networking Environment, various administrator tools and creating Active Directory Infrastructure Tools  
**Duration:** 143 hours  
**Theory:** 23 hours  
**Practice:** 120 hours

<table>
<thead>
<tr>
<th>Learning Unit</th>
<th>Learning Outcomes</th>
<th>Learning Elements</th>
<th>Duration</th>
<th>Materials Required</th>
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<tbody>
<tr>
<td><strong>LU1-</strong></td>
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<tr>
<td>Introduction</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>to Windows</td>
<td>Install Windows</td>
<td>Demonstrate</td>
<td>18 Hrs</td>
<td>Computers</td>
<td>Class Room / Lab</td>
</tr>
<tr>
<td>Server 2008</td>
<td>Server 2008</td>
<td>Installation</td>
<td></td>
<td>Presentations</td>
<td></td>
</tr>
<tr>
<td><strong>LU2-</strong></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Features of</td>
<td>Use DNS &amp; Win</td>
<td>Describe the</td>
<td>16 Hrs</td>
<td>Computers</td>
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<tr>
<td>Windows Server</td>
<td>Server</td>
<td>configuration</td>
<td></td>
<td>Presentations</td>
<td>Class Room / Lab</td>
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<tr>
<td>2008 Environment</td>
<td></td>
<td>process of:</td>
<td></td>
<td>MS Server 2008</td>
<td></td>
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<tr>
<td>**  **</td>
<td>Understanding and</td>
<td>i. DNS Configuration</td>
<td></td>
<td>DVDs</td>
<td></td>
</tr>
<tr>
<td>Use DHCP</td>
<td>use DHCP</td>
<td>ii. Win-Server</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>**  **</td>
<td>Understand and</td>
<td>Configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Application</td>
<td>use Application</td>
<td>i. Assigning IPs</td>
<td>15 Hrs</td>
<td>Computers</td>
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<tr>
<td>of File server</td>
<td>of File server</td>
<td>to Clients through</td>
<td></td>
<td>Presentations</td>
<td></td>
</tr>
<tr>
<td>**  **</td>
<td>Understand and</td>
<td>DHCP</td>
<td></td>
<td>MS Server 2008</td>
<td></td>
</tr>
<tr>
<td>Use Remote</td>
<td>use Remote</td>
<td>Explain practically the configuration of:</td>
<td>17 Hrs</td>
<td>DVDs</td>
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<tr>
<td>Access Server</td>
<td>Access Server</td>
<td>i. File Server</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>**  **</td>
<td>Understand and</td>
<td>(Permissions)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Print</td>
<td>use Print Server</td>
<td>ii. Resource</td>
<td></td>
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<tr>
<td>Server</td>
<td></td>
<td>Sharing</td>
<td></td>
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<tr>
<td>Perform practical to:</td>
<td></td>
<td>iii. Backup &amp; Restore</td>
<td>15 Hrs</td>
<td>Demos / Handouts</td>
<td></td>
</tr>
<tr>
<td>**  **</td>
<td></td>
<td>Remotely Manage Server / Clients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform practical to:</td>
<td></td>
<td>i. Manage the Printers</td>
<td>15 Hrs</td>
<td>Computers</td>
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<tr>
<td>**  **</td>
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<td>ii. Assign Print Jobs</td>
<td></td>
<td>Presentations</td>
<td></td>
</tr>
<tr>
<td>Perform practical to:</td>
<td></td>
<td>i. Manage the Printers</td>
<td>16 Hrs</td>
<td>Printers</td>
<td></td>
</tr>
<tr>
<td>**  **</td>
<td></td>
<td>ii. Assign Print Jobs</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>**  **</td>
<td></td>
<td></td>
<td>20 Hrs</td>
<td>Computers</td>
<td></td>
</tr>
</tbody>
</table>
| Understand and manage Various Utilities |  | Presentations
Demos / Handouts |
**Module 6 Title:** Trouble Shooting of a Network  
**Objective of the Module:** Enable the students to understand the connectivity, Window 7 and Window server 2008 trouble shooting methods  
**Duration:** 100 hours  
**Theory:** Nil hours  
**Practice:** 100 hours

<table>
<thead>
<tr>
<th>Learning Unit</th>
<th>Learning Outcomes</th>
<th>Learning Elements</th>
<th>Duration</th>
<th>Materials Required</th>
<th>Learning Place</th>
</tr>
</thead>
</table>
| LU1-Connectivity issues | Troubleshoot basic connectivity issues | Illustrate practically to resolve basic issues for:  
  i. Verify physical connection between computers  
  ii. Check either computers have been assigned TCP/IP  
  iii. Firewall features are disabled on home network adapters  
  iv. Test connectivity between using the "ping" command | 15 Hrs | Computers  
Network Infrastructure  
Packet Tracer | Classroom / Lab |
| | Troubleshoot file sharing and printer sharing | Explain practically and perform to:  
  i. Run Network Setup Wizard to configure network  
  ii. Work on file sharing configuration issues  
  iii. Work on folder sharing  
  iv. Test the connection between computer  
  v. Check the Network Setup Wizard log file for errors | 15 Hrs | Computers  
Network Infrastructure  
Packet Tracer | Classroom / Lab |
| LU2-  Window 7 troubleshooting | Troubleshoot malfunctioning in programs | Explain practically and perform to:  
   i. Run programs made for previous versions of Windows from control panel | 8 Hrs |  
| | Troubleshoot Audio Drivers | Explain practically and perform to:  
   i. Check Audio systems | 7 Hrs | Computers  
| | Troubleshoot I/O Devices | Practically explain to:  
   i. Check hardware and devices  
   ii. Check Input devices  
   iii. Check Output devices  
   iv. Check Processing devices  
   v. Check Storage devices  
   vi. Check Printers | 12 Hrs | Network Infrastructure  
| | Troubleshoot Communication devices | Practically explain to:  
   i. Check network adapters  
   ii. Recovery from backup | 8 Hrs | Packet Tracer | Classroom / Lab |
| LU3-  Window server 2008 troubleshooting methods | Troubleshoot Server 2008 | Explain practically and perform to:  
   i. Check OUs  
   ii. Check Users & Groups  
   iii. Check domain members  
   iv. Check DNS  
   v. Check Active Directory  
   vi. Recovery from backup | 35 Hrs | Computers  
| | | | | Network Infrastructure  
| | | | | Packet Tracer | Classroom / Lab |
## Assessment

### Module 1 Title: Fundamentals of Information Technology

<table>
<thead>
<tr>
<th>Learning Units</th>
<th>Theory hours</th>
<th>Workplace hours</th>
<th>Recommended formative assessment</th>
<th>Recommended Methodology</th>
<th>Scheduled Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M1-LU1</strong> Introduction to Information Technology</td>
<td>07 Hrs</td>
<td>Nil</td>
<td>Theoretically explain the concept of:</td>
<td>Practical Demonstration</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Introduction to Computer</td>
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</tr>
<tr>
<td></td>
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<td>- Computer History</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>- Computer generation</td>
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<td></td>
<td></td>
<td></td>
<td>- Data types, Processing Cycle</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>- Computer in Real life</td>
<td></td>
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</tr>
<tr>
<td><strong>M1-LU2</strong> Introduction to Computer Hardware</td>
<td>14 Hrs</td>
<td>50 Hrs</td>
<td>Demonstrate and install:</td>
<td>Practical Demonstration</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Input/output Devices (Keyboard, Mouse, Printer, Scanner)</td>
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<td></td>
<td></td>
<td></td>
<td>- CPU (CU, ALU, Cache)</td>
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<td></td>
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<td></td>
<td>- Memory and its Type (Primary &amp; Secondary)</td>
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<td></td>
<td>- Portable Devices (Flash Drive, Card Reader, External Drives and other peripherals)</td>
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<td>Demonstrate and assemble:</td>
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<td></td>
<td></td>
<td></td>
<td>- Motherboard (Data Cables, Sockets, Ports)</td>
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<td></td>
<td>- Storage devices (Hard Drive, CD/DVD)</td>
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<td>- Cards (NIC,</td>
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<tr>
<td><strong>M1-LU3</strong> Introduction to Computer Software</td>
<td>09 Hrs</td>
<td>24 Hrs</td>
<td>Explain theoretically the concept and use of:</td>
<td>Practical Demonstration</td>
<td></td>
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<td></td>
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<td></td>
<td>- Software and its Types</td>
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<tr>
<td></td>
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<td></td>
<td>- System Software and its uses</td>
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<td></td>
<td>- Application Software and its uses</td>
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</tbody>
</table>
**Module 2 Title:** Computer Networking

<table>
<thead>
<tr>
<th>Learning Units</th>
<th>Theory hours</th>
<th>Workplace hours</th>
<th>Recommended formative assessment</th>
<th>Recommended Methodology</th>
<th>Scheduled Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2-LU1 Introduction to Computer Network</td>
<td>21 Hrs</td>
<td>30 Hrs</td>
<td>Briefly describe theoretical concept of:</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Computer Networks</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Advantages / Disadvantages of Networks</td>
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<td></td>
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<td></td>
<td>Explain theoretical concept of:</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Local Area Network (LAN)</td>
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<td></td>
<td></td>
<td></td>
<td>- Metropolitan Area Network (MAN)</td>
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<td></td>
<td></td>
<td>- Wide Area Network (WAN)</td>
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<td>Explain pros &amp; cons of:</td>
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<td></td>
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<td></td>
<td>- Peer-to-Peer Network</td>
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<td></td>
<td>- Server Base Network</td>
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<td></td>
<td>- Hybrid Network</td>
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<td>- Data, Data rate, Bursty data</td>
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<td>- Baud rate, Peak data rate</td>
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<td></td>
<td></td>
<td>- Bandwidth</td>
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<td>Explain the layout of:</td>
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<td></td>
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<td></td>
<td>- Bus Topology</td>
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<td></td>
<td>- Star Topology</td>
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<td></td>
<td></td>
<td></td>
<td>- Ring Topology</td>
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<td></td>
<td></td>
<td></td>
<td>- Hybrid Topology</td>
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</tbody>
</table>
| M2-LU2 Network fundamentals | 11 Hrs | 60 Hrs | Demonstrate & examine use of:  
- Node  
- NIC  
- Modem  
- Access point  
- Hub (active & Passive)  
- Repeaters  
- Bridge  
- Switch  
- Router  

Explain the use of:  
- Simplex  
- Half duplex  
- Full duplex | Practical Demonstration |
| --- | --- | --- | --- |
| M2-LU3 Transmission Media | 14 Hrs | Nil | Describe physical layout of various cables and their usage:  
- Coaxial cable (10Base2, 10 Base 5, 10Base T, 10BaseFL, 100Base X)  
- Twisted Pair Cable (Cat 1, Cat 2, Cat 3, Cat 4, Cat 5, Cat 6)  
- Fiber Optic Cable  

Describe unguided media and their uses:  
- Terrestrial Microwaves  
- Radio Waves  
- Satellite  
- Wireless Communication | Practical Demonstration |
| M2-LU4 Types of connectors | 04 Hrs | 18 Hrs | Demonstrate and punching of various types of cables / connectors  
- RJ-45  
- RJ-11  
- BNC  
- Kevlar(fiber optic)  
- DB-9(Serial)  
- DB-25(Parallel) | Practical Demonstration |
### Module 3 Title: Client End/Window 7

<table>
<thead>
<tr>
<th>Learning Units</th>
<th>Theory hours</th>
<th>Workplace hours</th>
<th>Recommended formative assessment</th>
<th>Recommended Methodology</th>
<th>Scheduled Dates</th>
</tr>
</thead>
</table>
| **M3-LU1** Introduction to Operating Systems | 03 Hrs       | 18 Hrs          | Demonstrate and install / configure:  
- 32 bits and 64 bits OS  
- FAT-16/32, NTFS,  
- Configuration of Disks  
- Preparing Partitions and Volumes  
- Configurations of Device Drivers  
- Install / Upgrade / Troubleshoot Operating System | Practical Demonstration |                 |
| **M3-LU2** Features of Windows 7 | 03 Hrs       | 18 Hrs          | Demonstrate and install / configure:  
- NTFS permissions  
- Compress and uncompressed data  
- Data encryption and decryption  
- Memory quota implementation | Practical Demonstration |                 |
| **M3-LU3** Administrator Tools | 16 Hrs       | 144 Hrs         | Component Services  
- System Management  
- User Accounts  
- Event Viewer  
- iSCSI Initiator Local Security Policy  
- Performance Monitor  
- Task Scheduler  
- Windows Firewall / Defender  
- Diagnostic Tools  
- Network Configuration  
- Remote Desktop Connections  
- Optimizer / Compressor Backup and Restore | Practical Demonstration |                 |
## Module 4 Title: Connectivity

<table>
<thead>
<tr>
<th>Learning Units</th>
<th>Theory Days/hours</th>
<th>Workplace Days/hours</th>
<th>Recommended formative assessment</th>
<th>Recommended Methodology</th>
<th>Scheduled Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>M4-LU1 Introduction of OSI Model</td>
<td>10 Hrs</td>
<td>Nil</td>
<td>Application Layer Presentation Layer Session Layer Transport Layer Network Layer Data-link Layer Physical Layer</td>
<td>Practical Demonstration</td>
<td></td>
</tr>
</tbody>
</table>
| M4-LU2 Introduction of TCP/IP Model | 08 Hrs | 10 Hrs | Explain in detail TCP/IP Model:  
- Explain and demonstrate  
- Five Layers overview | Practical Demonstration | |
| M4-LU3 IP Addressing | 10 Hrs | 55 Hrs | Demonstrate and Explain IP Addresses  
- IPv4 & IPv6  
- IP Classes / Range  
- Network ID / BID  
- FLSM Computation  
- VLSM Computation  
- Subnet Masking | Practical Demonstration | |
**Module 5 Title:** Introduction to Window Server 2008

<table>
<thead>
<tr>
<th>Learning Units</th>
<th>Theory hours</th>
<th>Workplace hours</th>
<th>Recommended formative assessment</th>
<th>Recommended Methodology</th>
<th>Scheduled Dates</th>
</tr>
</thead>
</table>
| M5-LU1 Introduction to Windows Server 2008 | 12 Hrs | 30 Hrs | Demonstrate Installation process of:  
- Windows Server 2008 Installation  
- Active Directory  
- ADC / BDC | Practical Demonstration | |
| M5-LU2 Features of Windows Server 2008 Environment | 11 Hrs | 90 Hrs | Describe the configuration process of:  
- DNS Configuration  
- Win-Server Configuration  

Explain practically the configuration of:  
- Assigning IPs to Clients through DHCP  
Practically work on:  
- File Server (Permissions)  
- Resource Sharing  
- Backup & Restore  
Demonstrate remote management of:  
- Remotely Manage Server / Clients  
Perform practical to:  
- Manage the Printers  
- Assign Print Jobs  
Perform practical to:  
- Manage the Printers  
- Assign Print Jobs | Practical Demonstration | |
### Module 6 Title: Trouble Shooting of a Network

<table>
<thead>
<tr>
<th>Learning Units</th>
<th>Theory hours</th>
<th>Workplace hours</th>
<th>Recommended formative assessment</th>
<th>Recommended Methodology</th>
<th>Scheduled Dates</th>
</tr>
</thead>
</table>
| M6-LU1 Connectivity issues | Nil | 30 Hrs | Illustrate practically to resolve basic issues for:  
- Verify physical connection between computers  
- Check either computers have been assigned TCP/IP  
- Firewall features are disabled on home network adapters  
- Test connectivity between using the "ping" command  
Explain practically and perform to:  
- Run Network Setup Wizard to configure network  
- Work on file sharing configuration issues  
- Work on folder sharing  
- Test the connection between computer  
- Check the Network Setup Wizard log file for errors | Practical Demonstration | |
| M6-LU2 Window 7 trouble shooting methods | Nil | 35 Hrs | Explain practically and perform to:  
- Run programs made for previous versions of Windows from control panel  
Explain practically and perform to:  
- Check Audio systems  
Practically explain to:  
- Check hardware and devices  
- Check Input devices  
- Check Output devices  
- Check Processing devices  
- Check Storage devices | Practical Demonstration | |
<table>
<thead>
<tr>
<th>M6-LU3 Windows Server 2008 Troubleshooting Methods</th>
<th>Nil</th>
<th>35 Hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practically explain to:</td>
<td></td>
<td></td>
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<tr>
<td>- Check network adapters</td>
<td></td>
<td></td>
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<tr>
<td>- Recovery from backup</td>
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<td></td>
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<tr>
<td>Explain practically and perform to:</td>
<td></td>
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<tr>
<td>- Check OUs</td>
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<tr>
<td>- Check Users &amp; Groups</td>
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<tr>
<td>- Check domain members</td>
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<tr>
<td>- Check DNS</td>
<td></td>
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<tr>
<td>- Check Active Directory</td>
<td></td>
<td></td>
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<tr>
<td>- Recovery from backup</td>
<td></td>
<td></td>
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<tr>
<td>Practical Demonstration</td>
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</tbody>
</table>
Supportive notes

- Assessment context
  The unit assessment can be taken on the job environment or at lab, may be both. The competency may also check by observing individual is working or as part of team.

- Critical aspects
  The candidate must be able to vigilant to the dynamic situation and can handling of equipment, comprehend of safety measures related with computer proper maintenance.

- Assessment condition
  The learner will have access to all tools, equipments material and manual required for this module. Proper time period will be given to candidate.

- Resources required for assessment
  All network related equipments with necessary accessories including software and hardware tools.
# List of Machinery / Equipment

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of Equipment</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Server Machine (64 bit/32 bit)</td>
<td>02</td>
</tr>
<tr>
<td>2</td>
<td>Client Station/Desktop Computers</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Network card or wireless card</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>Wireless Adapter, Router, Modem</td>
<td>30</td>
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<tr>
<td>5</td>
<td>LCDs</td>
<td>27</td>
</tr>
<tr>
<td>6</td>
<td>Hubs</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Repeaters</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>Bridges</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Switches</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Routers</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Multimedia</td>
<td>02</td>
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<tr>
<td>12</td>
<td>Printer hp Laser Jet</td>
<td>01</td>
</tr>
<tr>
<td>13</td>
<td>Crimping Tools Set</td>
<td>06</td>
</tr>
<tr>
<td>14</td>
<td>Cable Tester</td>
<td>06</td>
</tr>
<tr>
<td>15</td>
<td>Connectors (BNC, Rj45, Rj11, Kevlar, DB9, DB25)</td>
<td>100 each</td>
</tr>
<tr>
<td>16</td>
<td>Cables (Coaxial, UTP, STP (CAT1-6), Fiber Optic</td>
<td>1 Roll each</td>
</tr>
</tbody>
</table>

Minimum Qualification of Teachers / Instructor

The qualification of teachers / instructor of this course should be:-

- MCS/MIT
- Bachelors with computers (Hons)
- DAE (Computer)
- PGD in Computer

Reference books

- Network Essential
- Data Com and Networking by William Stallling
- Window 7 Step by Step
- Window Server 2008 Step by Step
National Curriculum Review Committee Members

The following members participated in this meeting

1. Muhammad Khalid (Associate Professor, GCMS, Peshawar)
2. Engr. Syed Waji-ui-Husnain Sherazi (HOD IT Department GCTR-AJK)
3. Wisal Muhammad (Dy. Director, IT Estb Dept, Peshawar)
4. Faisal Rahim (Lecturer in Comp. Sc GCMS, Peshawar)
5. Muhammad Shahid (Instructor in Staff Training Inst. Quetta)
6. Ghulam Raza Hussain (Sr. Inst VTC Nushki)
7. Arif Jamil Lecturer (GMI Orangi Town Karachi)
8. Mazhar Javed Awan (Lecturer South Asia Univ Lahore)
9. Abdual Hafeez Abbasi (Incharge QA/MIS, Sind TEVETA)
10. Sheikh Humayun Bashir (Sr. Instructor-IT, TEVTA-Punjab)