Technologica Computer Education Society (Govt.Regd)
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-:Hardware-Syllabus:-

1) Assembling Details Configuration and Compatibility
    a. CPU
    b. MOTHER BOARD
    c. RAM
    d. SMPS
    e. HARDISKS
    f. OPTICAL DRIVES
    g. BIOS AND UEFI
    h. PCI SLOTS AND CARDS

2) Operating System Installation (Windows)
    a. Windows XP
    b. Windows XP (Service Packs)
    c. Windows XP (Service Pack Conversion – Without Formatting)
    d. Windows 7
    e. Windows 7 (Service Pack)
    f. Windows 8
    g. Windows 8.5
    h. Windows 10
    i. Windows 10 (Update installation without internet and Formatting)
    j. Windows 11
    k. Windows Installation Using Hiren Boot CD/DVD
    l. Windows Installation Using UBCD
    m. Windows Installation Using Live CD
    n. Windows Installation Using Light Version
    o. WINDOWS 98 (Virtual)
    p. WINDOWS ME (Virtual)
    q. WINDOWS 2000 PROF (Virtual)
    r. WINDOWS XP PROFESSIONAL (Virtual)
    s. WINDOWS XP PROFESSIONAL SERVICE PACK 1 (32BIT / 64 BIT) (Virtual)
    t. WINDOWS XP PROFESSIONAL SERVICE PACK 2 (32BIT / 64 BIT) (Virtual)
    u. WINDOWS XP PROFESSIONAL SERVICE PACK 3 (32BIT / 64 BIT) (Virtual)
    v. WINDOWS VISTA (32BIT / 64 BIT) (Virtual)

w. WINDOWS 7 (HOME / PROFESSIONAL / STARTER / ULTIMATE) (32BIT / 64 BIT) (Virtual)
x. WINDOWS 8 (HOME / PROFESSIONAL / STARTER / ULTIMATE) (32BIT / 64 BIT) (Virtual)
y. WINDOWS 8.1 (HOME / PROFESSIONAL / STARTER / ULTIMATE) (32BIT / 64 BIT) (Virtual)
z. WINDOWS 10 (HOME / PROFESSIONAL / STARTER / ULTIMATE) (32BIT / 64 BIT) (Virtual)
aa. WINDOWS LITE VERSIONS FOR COMPUTERS. (Virtual)
bb. WINDOWS MODIFIED VERSIONS. (Virtual)

3) Making bootable CD/DVD/Pen Drive from ISO Files
    a. Using Nero
    b. Using Power ISO
    c. Using Windows (Windows 10 Only)
    d. Using Daemon Tools
    e. Single Boot Pen Drive (Using DOS)
    f. Single Boot Pen Drive (Using third party tools)
    g. Multi Boot Pen Drive

4) Operating System Installation (LINUX And Android)
   (LINUX INSTALLATIONS AND ADMINISTRATIONS)
    a. UBUNTU
    b. EDUBUNTU
    c. MINT
    d. SUSE
    e. REDHAT
    f. FEDORA
    g. PUPPY LINUX
    h. ANDLINUX
    i. KDE OR WINDOWS
    j. KALI / BACKTRACK LINUX INSTALLATION and Administration
    k. KNNOPIX / DYNABOLIC INSTALLATION and Administration
    l. ZORIN OS
5) LINUX AND WINDOWS DUAL BOOT SYSTEMS.
6) LIVE CD/DVD FOR WINDOWS AND LINUX
7) ANDROID FOR DESKTOPS.
8) Windows Run Commands
9) 7 types of Software Installations
    a. Without Serial Key
    b. With Serial Key
    c. Crack
    d. Patch
    e. Registry Edit

f. Manually
g. Programmer Defined

10) Critical software Installations (at least 10)
    a. Leap Office
    b. Bijoy Bayanno
    c. Java
    d. Visual Studio
    e. AutoCad
    f. 3D Max
    g. Photoshop CS2
    h. Corel x3

11) Virus and Anti Virus Installations
12) 3 types of backups
13) PC optimizations / Modifications
14) Sound Configurations – Sound Optimization
15) Printer Installation and Configuration
16) Scanner Installation and Configuration
17) CCTV Installation and Configuration
18) Trouble Shooting and Fault finding
19) Hiren CD / DVD Tools and Uses
20) Other Utility Tools and Installation and Configuration

Networking Syllabus

1. Guided Media
2. Unguided Media
3. Types of Networking and topologies
4. Networking Equipment
5. Bandwidth, Baud, Channel Capacity
6. OSI Layers
7. TCP IP Layers
8. IP v 4
9. IP v 6
10. Subnets
11. Protocols
12. Ports
13. Networking CMD and PowerShell
14. Peer to Peer Networking
15. Cybercafé install and resource Sharing.

16. Screen Sharing
17. Penetrations testing without Kali Linux
18. Penetrations testing with Kali Linux
19. Virus and rootkits making analyses and destroy.
20. Using Scripts to solve problems on network
21. Understanding Security issues and solutions.
22. Network Protection.
23. Compatia N+ Preparations.
24. Virtual Networking
25. Cloud computing
26. Wireless Networks

CompTIA Network+ (N+) Exam Preparation

1. Protocols and ports
SSH 22
DNS 53
SMTP 25
SFTP 22
FTP 20, 21
TFTP 69
TELNET 23
DHCP 67, 68
HTTP 80
HTTPS 443
SNMP 161
RDP 3389
NTP 123
SIP 5060, 5061
SMB445
POP 110
IMAP 143
LDAP 389
LDAPS 636
H.323 1720
2. Protocol types
ICMP
UDP
TCP
IP
3. Connection-oriented vs. connectionless

Explain devices,
applications, protocols
and services at their
appropriate OSI layers.
1. Layer 1 – Physical
2. Layer 2 – Data link
3. Layer 3 – Network
4. Layer 4 – Transport
5. Layer 5 – Session
6. Layer 6 – Presentation
7. Layer 7 – Application
Explain the concepts and
characteristics of routing
and switching.
1. Properties of network traffic
Broadcast domains
CSMA/CD
CSMA/CA

Topic Details
Collision domains
Protocol data units
MTU
Broadcast
Multicast
Unicast
2. Segmentation and interface properties
VLANs
Trunking (802.1q)
Tagging and untagging ports
Port mirroring
Switching loops/spanning tree
PoE and PoE+ (802.3af, 802.3at)
DMZ
MAC address table
ARP table
3. Routing
Routing protocols (IPv4 and IPv6)
- Distance-vector routing protocols
RIP

EIGRP
- Link-state routing protocols
OSPF
- Hybrid
BGP
Routing types
Static
Dynamic
Default
4. IPv6 concepts
Addressing
Tunneling
Dual stack
Router advertisement
Neighbor discovery
5. Performance concepts
Topic Details
Traffic shaping
QoS
Diffserv
CoS
6. NAT/PAT
7. Port forwarding
8. Access control list
9. Distributed switching
10. Packet-switched vs. circuit switched network
11. Software-defined networking
Given a scenario,
configure the appropriate
IP addressing
components.
1. Private vs. public
2. Loopback and reserved
3. Default gateway
4. Virtual IP
5. Subnet mask
6. Subnetting
Classful
Classes A, B, C, D, and E
Classless

VLSM
CIDR notation (IPv4 vs. IPv6)
7. Address assignments
DHCP
DHCPv6
Static
APIPA
EUI64
IP reservations

Topic Details
Compare and contrast
the characteristics of
network topologies, types
and technologies.
1. Wired topologies
Logical vs. physical
Star
Ring
Mesh
Bus
2. Wireless topologies
Mesh
Ad hoc
Infrastructure
3. Types
LAN
WLAN
MAN
WAN
CAN
SAN
PAN
4. Technologies that facilitate the Internet of Things (IoT)
Z-Wave
Ant+
Bluetooth
NFC
IR

RFID
802.11

Topic Details

Given a scenario, implement the appropriate wireless technologies and configurations.

1. 802.11 standards
a b g n
ac
2. Cellular
GSM
TDMA
CDMA
3. Frequencies
2.4GHz
5.0GHz
4. Speed and distance requirements
5. Channel bandwidth
6. Channel bonding
7. MIMO/MU-MIMO
8. Unidirectional/omnidirectiona
9. Site surveys

Summarize cloud concepts and their purposes.

1. Types of services
SaaS
PaaS
IaaS
2. Cloud delivery models
Private
Public
Hybrid
3. Connectivity methods
4. Security implications/considerations
5. Relationship between local and cloud resources

Topic Details

Explain the functions of network services.

1. DNS service

Record types

A, AAAA

TXT (SPF, DKIM)

SRV

MX

CNAME

NS

PTR

Internal vs. external DNS

Third-party/cloud-hosted DNS

Hierarchy

Forward vs. reverse zone

2. DHCP service

MAC reservations

Pools

IP exclusions

Scope options

Lease time

TTL

DHCP relay/IP helper

3. NTP

4. IPAM

1. Media types

Copper

UTP

STP

Coaxial

Fiber

Single-mode

Multimode

2. Plenum vs. PVC

3. Connector types

Copper

RJ-45
RJ-11

Topic Details
BNC
DB-9
DB-25
F-type
Fiber
LC
ST
SC
APC
UPC
MTR
4. Transceivers
SFP
GBIC
SFP+
QSFP
Characteristics of fiber transceivers
Bidirectional
Duplex
5. Termination points
66 block
110 block
Patch panel
Fiber distribution panel
6. Copper cable standards
Cat 3
Cat 5
Cat 5e
Cat 6
Cat 6a
Cat 7
RG-6
RG-59
7. Copper termination standards
TIA/EIA 568a

TIA/EIA 568b
Crossover

8. Ethernet deployment standards
100BaseT
1000BaseT
1000BaseLX
1000BaseSX
10GBaseT
Given a scenario, determine the appropriate placement of networking devices on a network and install/configure them.
1. Firewall
2. Router
3. Switch
4. Hub
5. Bridge
6. Modems
7. Wireless access point
8. Media converter
9. Wireless range extender
10. VoIP endpoint
Explain the purposes and use cases for advanced networking devices.
1. Multilayer switch
2. Wireless controller
3. Load balancer
4. IDS/IPS
5. Proxy server
6. VPN concentrator
7. AAA/RADIUS server
8. UTM appliance
9. NGFW/Layer 7 firewall
10. VoIP PBX
11. VoIP gateway
12. Content filter

1. Virtual networking components
Virtual switch
Virtual firewall
Virtual NIC
Virtual router
Hypervisor
2. Network storage types
NAS
SAN
3. Connection type
FCoE
Fibre Channel
iSCSI
InfiniBand
4. Jumbo frame

1. Service type
ISDN
T1/T3
E1/E3
OC-3 – OC-192
DSL
Metropolitan Ethernet
Cable broadband
Dial-up
PRI
2. Transmission mediums
Satellite
Copper
Fiber
Wireless
3. Characteristics of service
MPLS
ATM
Frame relay
PPPoE
PPP
DMVPN

SIP trunk
4. Termination
Demarcation point
CSU/DSU
Smart jack

1. Diagram symbols
2. Standard operating procedures/ work instructions
3. Logical vs. physical diagrams
4. Rack diagrams
5. Change management documentation
6. Wiring and port locations
7. IDF/MDF documentation
8. Labeling
9. Network configuration and performance baselines
10. Inventory management
Compare and contrast
business continuity and
disaster recovery
concepts.
1. Availability concepts
Fault tolerance
High availability
Load balancing
NIC teaming
Port aggregation
Clustering
Power management
Battery backups/UPS
Power generators
Dual power supplies
Redundant circuits
2. Recovery
Cold sites
Warm sites
Hot sites
Backups
Full
Differential
Incrementa

Snapshots
3. MTTR
4. MTBF
5. SLA requirements

1. Processes
Log reviewing
Port scanning
Vulnerability scanning
Patch management
Rollback
Reviewing baselines
Packet/traffic analysis
2. Event management
Notifications
Alerts
SIEM
3. SNMP monitors
MIB
4. Metrics
Error rate
Utilization
Packet drops
Bandwidth/throughput

1. VPN
IPSec
SSL/TLS/DTLS
Site-to-site
Client-to-site
2. RDP
3. SSH
4. VNC
5. Telnet
6. HTTPS/management URL
7. Remote file access
FTP/FTPS

SFTP
TFTP
8. Out-of-band management
Modem
Console router
Identify policies and best
practices.
1. Privileged user agreement
2. Password policy
3. On-boarding/off-boarding procedures
4. Licensing restrictions
5. International export controls
6. Data loss prevention
7. Remote access policies
8. Incident response policies
9. BYOD
10. AUP
11. NDA
12. System life cycle
Asset disposal
13. Safety procedures and policies

1. Detection
Motion detection
Video surveillance
Asset tracking tags
Tamper detection
2. Prevention
Badges
Biometrics
Smart cards
Key fob
Locks
Explain authentication
and access controls.
1. Authorization, authentication and accounting
RADIUS
TACACS+
Kerberos
Single sign-on

Local authentication
LDAP
Certificates
Auditing and logging
2. Multifactor authentication
Something you know
Something you have
Something you are
Somewhere you are
Something you do
3. Access control
802.1x
NAC
Port security
MAC filtering
Captive portal
Access control lists

1. WPA
2. WPA2
3. TKIP-RC4
4. CCMP-AES
5. Authentication and authorization
EAP
PEAP
EAP-FAST
EAP-TLS
Shared or open
Preshared key
MAC filtering
6. Geofencing
Summarize common
networking attacks.
1. DoS
Reflective
Amplified
Distributed
2. Social engineering
3. Insider threat

4. Logic bomb
5. Rogue access point
6. Evil twin
7. War-driving
8. Phishing
9. Ransomware
10. DNS poisoning
11. ARP poisoning
12. Spoofing
13. Deauthentication
14. Brute force
15. VLAN hopping
16. Man-in-the-middle
17. Exploits vs. vulnerabilities

1. Changing default credentials
2. Avoiding common passwords
3. Upgrading firmware
4. Patching and updates
5. File hashing
6. Disabling unnecessary services
7. Using secure protocols
8. Generating new keys
9. Disabling unused ports

IP ports
Device ports (physical and virtual)

Explain common
mitigation techniques
and their purposes.

1. Signature management
2. Device hardening
3. Change native VLAN
4. Switch port protection

Spanning tree
Flood guard
BPDU guard
Root guard
DHCP snooping

5. Network segmentation

DMZ
VLAN
6. Privileged user account
7. File integrity monitoring
8. Role separation
9. Restricting access via ACLs
10. Honeypot/honeynet
11. Penetration testing

1. Identify the problem
Gather information
Duplicate the problem, if possible
Question users
Identify symptoms
Determine if anything has changed
Approach multiple problems individually
2. Establish a theory of probable cause
Question the obvious
Consider multiple approaches
Top-to-bottom/bottom-to-top OSI model
Divide and conquer
3. Test the theory to determine the cause
Once the theory is confirmed, determine the next steps to resolve the problem
If the theory is not confirmed, reestablish a new theory or escalate
4. Establish a plan of action to resolve the problem and identify potential effects
5. Implement the solution or escalate as necessary
6. Verify full system functionality and, if applicable, implement preventive measures
7. Document findings, actions, and outcomes

1. Hardware tools
Crimper
Cable tester
Punchdown tool
OTDR
Light meter

Tone generator
Loopback adapter
Multimeter
Spectrum analyzer
2. Software tools
Packet sniffer
Port scanner
Protocol analyzer
WiFi analyzer
Bandwidth speed tester
Command line
ping
tracert, traceroute
nslookup
ipconfig
ifconfig
iptables
netstat
tcpdump
pathping
nmap
route
arp
dig

Topic Details

Given a scenario, troubleshoot common wired connectivity and performance issues.

1. Attenuation
2. Latency
3. Jitter
4. Crosstalk
5. EMI
6. Open/short
7. Incorrect pin-out
8. Incorrect cable type
9. Bad port
10. Transceiver mismatch

11. TX/RX reverse
12. Duplex/speed mismatch
13. Damaged cables
14. Bent pins
15. Bottlenecks
16. VLAN mismatch
17. Network connection LED status indicators

1. Reflection
2. Refraction
3. Absorption
4. Latency
5. Jitter
6. Attenuation
7. Incorrect antenna type
8. Interference
9. Incorrect antenna placement
10. Channel overlap
11. Overcapacity
12. Distance limitations
13. Frequency mismatch
14. Wrong SSID
15. Wrong passphrase
16. Security type mismatch
17. Power levels
18. Signal-to-noise ratio

1. Names not resolving
2. Incorrect gateway
3. Incorrect netmask
4. Duplicate IP addresses
5. Duplicate MAC addresses
6. Expired IP address
7. Rogue DHCP server
8. Untrusted SSL certificate
9. Incorrect time
10. Exhausted DHCP scope
11. Blocked TCP/UDP ports
12. Incorrect host-based firewall settings
13. Incorrect ACL settings

14. Unresponsive service
15. Hardware failure

Servers

Windows Server 2000

Windows Server 2003

Windows Server 2008

1 Active Directory - Introduction
2 Active Directory Benefits
3 Active Directory 2008 Tutorial - New features
4 New features in Detail Active Directory 2008
5 Active Directory Objects - Part 5
6 Active Directory Domain - Active Directory
7 Active Directory Tree - Active Directory
8 Active Directory Forest - Active Directory
9 Active Directory Organizational Unit (OU) - Active Directory
10 Active Directory Schema - Active Directory
11 Functional Level in Windows Server 2008 - Active Directory
12 Raise Domain Functional Level - Active Directory
13 Raise Forest Functional Level - Active Directory
14 Active Directory Trust
15 Active Directory Partitions or NC - Active Directory
16 Active Directory Installation Requirements - Server 2008 Active Directory
17 Active Directory Installation and Configuration 2008 (2008 R2)
18 Backup Domain Controller in Windows Server 2008 (Hindi) - Active Directory
19 Active Directory Windows Server Core 2008 Unattended Installation
20 FSMO Roles in Active Directory 2008
21 Schema Master - FSMO Roles
22 Domain Naming Master - FSMO Roles
23 RID Master - FSMO Roles
24 PDC Master - FSMO Roles
25 Infrastructure Master - FSMO Roles FSMO
26 Placement of FSMO Roles - FSMO Roles
27 Transfer Vs Seize - FSMO Roles
28 Transfer RID PDC Infrastructure - FSMO Roles
29 Transfer Domain Naming Master - FSMO Roles
30 Transfer Schema Master - Active Directory FSMO Roles
31 Transfer RID PDC Infrastructure Master using NTDSUTIL Command - FSMO Roles
32 Seize RID PDC Infrastructure Schema Master - FSMO Roles

33 Seize FSMO Roles Using NTDSUTIL - FSMO Roles
34 Windows Server 2008 Active Directory User and Group
35 Active Directory Windows Server 2008 - Join Computer to Domain in Hindi
36 Home Directory for Domain Users using Profile - Active Directory Server 2008
37 Dsadd command How to Create Users in Windows server 2008 (Hindi)
38 Active Directory Users Dsadd User Script How to Create Bulk Users
39 Dsadd command Create Active Directory Groups anOU Windows 2008
40 DSMOD command Modify Users Groups in Active Directory
41 DSMOVE command Move Users Computers Groups in Active Directory
42 Active Directory DSMOVE Command Rename User Computer Group
43 LDIFDE command Create Users command in Server 2008
44 Active Directory 2008 LDIFDE command Create Group
45 Active Directory 36 CSVDE command Create Users in Windows server 2008
46 Active Directory 37 CSVDE command Create Groups in Windows Server 2008
47 (Server 2008) Server Core Installation and configuration in hindi
48 Server Core 2008 - Configuration
49 Server Core 2008 DNS Server Address Configuration
50 Server Core 2008 Rename Computer
51 Join Server Core to domain - Server 2008
52 Server 2012 Planning OU Structure & Nesting OU

Windows Server 2012

Windows Server 2012 - Home
Overview
Installation
Server Roles
PowerShell
Remote Management
Windows Firewall
Remote Desktop Management
Resource Monitor
Active Directory
DC Accounts
File System
Group Managed Service Accounts
Group Policy Overview
DHCP Role
DNS Role
Primary Zones
Manage Records
IIS Overview
IIS Security
Hyper-V

Advanced Configuration
Configure WSUS Role
WSUS Policies & Tuning
Sharing of Files
File Manager
Print Server
Easy Printing
Configure Print Drivers
Network Services
Backup Management

Windows Server 2016

Chapter 1 Installing Windows Server 2016
Chapter 2 Installing in the Enterprise
Chapter 3 Configuring Storage and Replication
Chapter 4 Understanding Hyper-V
Chapter 5 Configuring High Availability
Chapter 6 Understanding Clustering
Chapter 7 Configuring Windows Containers
Chapter 8 Maintaining Windows Server
Chapter 9 Understanding Monitoring
Chapter 10 Configuring TCP/IP
Chapter 11 Configuring DNS
Chapter 12 Configuring DHCP
Chapter 13 Implement IP Address Management
Chapter 14 Configuring Network Access
Chapter 15 Understanding File Services
Chapter 16 Configuring High Availability
Chapter 17 Implementing Software Defined Networking
Chapter 18 Installing Active Directory
Chapter 19 Administer Active Directory
Chapter 20 Maintaining Active Directory
Chapter 21 Implementing GPOs
Chapter 22 Understanding Certificates
Chapter 23 Configure Access and Information Protection Solutions

Windows Server 2019

Chapter 1 Installing Windows Server 2019
Chapter 2 Installing in the Enterprise
Chapter 3 Configuring Storage and Replication
Chapter 4 Understanding Hyper-V