



GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

IT, Networking and Cloud

(Designed in 2017)

Technical Diploma (Tech. Diploma)
NSQF LEVEL –6



Directorate General of Training



ACKNOWLEDGEMENT

The DGT sincerely acknowledges contributions of the Industries, Trade Experts, Domain Experts and all others who contributed in Designing the curriculum. Special acknowledgement is expended by DGT to the following expert members who had contributed immensely in this curriculum.

List of Expert members participated for finalizing the course curricula of IT, Networking and Cloud held at Apex Hi-Tech Institute, Bengaluru

Sl. No.	Name & Designation Shri/Mr./Ms.	Organization	Remarks
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2	Shri Shivam Sharma, CEO	Transnueron Technologies, Bangalore	Member
3	Ms. Joyeeta Das, Lead Education Program	IBM India, Bangalore	Member
4	Ms. Shikha, Manager	TNT, Bangalore	Member
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10	Shri Raju K, Assistant Director	AHI, Bangalore	Member
11	Shri Altaf Hossain, Training Officer	ATI, Howrah	Member
12	Ms. P. Narmada, Vocational Instructor	RVTI(W), Bangalore	Member



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COURSE STRUCTURE

Core Module 1 : Computer Hardware Maintenance : 320 Hrs

Practical	200 Hours
Theory	120 Hours
Total number of Hours	320 Hours

Core Module 2 :Computer Networking : 320 Hrs

Practical	200 Hours
Theory	120 Hours
Total number of Hours	320 Hours

Core Module 3 : Web Designing : 320 Hrs

Practical	200 Hours
Theory	120 Hours
Total number of Hours	320 Hours

Core Module 4 : Web Development : 320 Hrs

Practical	200 Hours
Theory	120 Hours
Total number of Hours	320 Hours

Core Module 5 : Business Data Analytics : 320 Hrs

Practical	200 Hours
Theory	120 Hours
Total number of Hours	320 Hours



Note : The trainee must complete all the 5 core modules

Elective Subject 1 : Cloud Application Developer : 320 Hrs.	
Practical	200 Hours
Theory	120 Hours
Total number of Hours	320 Hours

Elective Subject 2 : Cloud Enterprise Developer : 320 Hrs.	
Practical	200 Hours
Theory	120 Hours
Total number of Hours	320 Hours

Elective Subject 3 : Web Development using Java : 320 Hrs.	
Practical	200 Hours
Theory	120 Hours
Total number of Hours	320 Hours

Note : The trainee must select any of two Elective Modules in above three elective modules

After completion of each Core Module and Elective Module the trainee should complete the project work of relevant field for 40 Hours

On the Job Training : Every trainee must do In-Plant Training in respective field	
Total number of Hours	800 Hours

Employability Skill : This module is common for all Diploma courses



Total number of Hours	160 Hours
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COURSE INFORMATION

Name of the Course	IT, Networking and Cloud
Period	Two Years
Entry Qualification	10 th Class + NTC/NAC in Computer Software Application (CSA) / Computer Hardware & Network Maintenance (CHNM) Trades
Examination Authority	National Council for Vocational Training Directorate General of Training Ministry of Skill Development & Entrepreneurship Government of India
No. Of Subjects	Compulsory Core Subjects : Five Elective Subjects : Two Industrial Training Common Subject : One
Pattern	Skill Based, 70% Practical & 30% Theory
Method of Qualification	Credit Based
NCO – 2015	2512.0100 – Computer Programmer / Software Engineer 2521.0202 – Junior Data Associate 2513.0101 – Web Developer 2513.0201 – User Interface Developer 2523.0100 – Data Communication Analyst / Network Administrator 2523.0200 – Computer System Hardware Analyst / Hardware Engineer
NSQF Level	Level 6
Unit Strength	20
Space Norms	70 Sq. metres
Power Norms	3.45 KW (for two units in one shift)
Instructors Qualification for	
1. IT, Networking and Cloud	Engineering in Computer Science/Information Technology/MCA/MSc. Computer Science/Information Technology



	<p>from recognized university with one year experience in the relevant field.</p> <p>OR</p> <p>Diploma in Computer Science/Information Technology/MCA/MSc. Computer Science/Information Technology from recognized university with one year experience in the relevant field.</p>
2. Employability Skill	<p>MBA OR BBA with two years experience OR Graduate in Sociology/ Social Welfare/ Economics with Two years experience OR Graduate/ Diploma with Two years experience and trained in Employability Skills from DGET institutes.</p> <p style="text-align: center;">AND</p> <p>Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above.</p> <p>OR</p> <p>Existing Social Studies Instructors duly trained in Employability Skills from DGET institutes</p>



JOB ROLE

Brief description of Job roles:

Computer Hardware Maintenance

- Disassembling and assembling of PC and its I/O devices
- Troubleshooting of PC
- Connecting external devices to PC
- Installation of software and Operating system
- Working with Windows and Linux operating systems
- Customisation of PC
- Managing PC
- Service and Maintenance of Computer Hardware

Computer Networking

- Connect Peer to Peer Network, Local Area network, configure IP address
- Install and configure server-client network
- Backup and restore ADS, DHCP and user data
- Permit FAT and NTFS sharing
- Add accounts, implement User Authentication strategy
- Configure User Environment
- Install and configure DNS, DHCP, FTP, HTTP and IIS Services
- Install Linux server, create new user and group, create public and data directory
- Secure and run SWAT
- Filter ports
- Install and configure Telnet



- Configure & Implement unmanageable Network Switch
- Configure and Implement Manageable Network Switch
- Install and configure router, bridges, HUB, wire network and Wireless network
- Configure wireless Access Point
- Manage broadband
- Troubleshoot internet connectivity
- Managing Server Network security
- Monitor and trouble shoot network protocol
- Configure Local Security Policies and Domain Security Policies
- Manage TCP/IP routing
- Connect remote desktop using Telnet, Hypernet and team viewer
- Configure web browser
- Handling spam

Web Designing

- Create HTML documents is HTML editors Note Pad/Coffee cup
- Create texts, lists, tables, frames with HTML
- Create Hyperlinks images and multimedia
- Create forms and controls
- Making Web sites using HTML
- Creating interactive Style Sheets with text, fonts, borders, backgrounds, padding
- Write CSS coding for inclusion, embedded, Inline, External CSS
- Create layers, pseudo classes and media
- Create page layout and site designing with CSS
- Create own account in cloud and launch and track no. of visitors
- Hosting Amazon web server
- Manage the Database using Mongo DB
- Installation of Webserver
- Write PHP coding by using functions



- Build Web Pages with PHP, links and URLs
- Populate MYSQL database, relational database tables
- Access MY SQL, working with retrieved data, creating records with PHP
- Making websites, web servers, game frameworks, desktop and CLI (Command Language Interpreter) applications, and IDE using Python

Web Development

- Creating web page content using HTML and enabling HTTP
- Create Dynamic Web pages and form validations using HTML 5
- Creation of Style Sheets in Dynamic Web Pages
- Creation of forms, databases, Cookies, APIs, integrating with other websites, scaling issues in PHP
- Development of Java applets
- Development of online Websites using HTML 5, CSS, PHP and Java

Business Data Analytics

- Manipulate different types of data
- Online analytics processing using OLAP tools for multidimensional analytics queries
- Use OLTP for CRM and retail sales using web focus info assist or Excel
- Able to work on Data integration, data clearing, dimension, data warehousing. Data visualizing
- Cluster analysis, segregating processed data into different patterns
- Data mining through Bayesian network, Regression Analysis, Correlation Analysis, Cluster Analysis.
- Machine Learning Approach through Decision tree induction method, inductive concept learning, conceptual cluster learning
- Oriented induction, iterative database scanning, attribute focusing.

Cloud Application Developer



- Describe the emerging paradigms that are leading to the adoption of cloud computing and its service model
- Use of Cloud platform and its service
- Application development on the cloud (using Eclipse, Node.js)
- Working with the WebSphere /Deployment environment

Cloud Enterprise Developer

- Build a web application with the Express framework
- Use Web Sphere Development Tools to deploy applications to a server
- Hands-on on Cloud Integration.
- Use cloud tools to monitor, tune, and troubleshoot

Web Development using Java

- Object Oriented Programming Concepts through Java.
- Writing programs based on real time scenarios using Java.
- Configuring Java Web server environment setup for WebPages.
- Developing simple Web pages using Java Servlets.
- Web page development & deployment using server-client technology.
- Web site creation using cookies and sessions.
- Creating Back-end support for web site.
- Creation of database from JDBC application.
- Making use of JDBC drivers for creating connection with WebPages.
- Selecting, Editing, Updating, Deletion of web data in data base.
- Saving and retrieving of images in database by java programming.

Reference NCO-2015:

- 2512.0100 – Computer Programmer / Software Engineer
- 2521.0202 – Junior Data Associate
- 2513.0101 – Web Developer



- 2513.0201 – User Interface Developer
- 2523.0100 – Data Communication Analyst / Network Administrator
- 2523.0200 – Computer System Hardware Analyst / Hardware Engineer

SYLLABUS

Syllabus for Diploma in “IT, Networking and Cloud”					
Core Module 1 : Computer Hardware Maintenance : 320 Hrs					
Week No.	Learning outcome	Professional Skills (Trade Practical)	No. of Hrs	Professional Knowledge (Trade Theory)	No. of Hrs
1	Able to use basic PC hand tools effectively (1-8 Hrs)	Skills on using Basic PC Hand Tools <ul style="list-style-type: none"> • Remove screws using screw driver • Cut and Skin cables using cutting plier • Desolder electronic components using desoldering pump, Remove electronic components using tweezers • Solder electronic components • Crimp CAT 6 cables using crimping tool 	5 1 1 1 1 1	Hand Tools <ul style="list-style-type: none"> • Specifications of Tweezers, Screw Driver, Cutting Pliers, Crimping Tool, Soldering Iron, De-soldering Pump • Safety hazards on basic hand tools 	3
	Able to Disassemble and assemble PC (9-24Hrs)	Disassembling PC <ul style="list-style-type: none"> • Remove power cords and peripheral cables • Remove the cabinet and identify the components, slots, sockets, and connectors of motherboards. • Remove the SMPS • Remove Hard disk Drive, RAM, CMOS Battery, coolant fan and DVD/BD Drive • Remove add on cords Assembling PC	5 1 1 1 1 5 1	Disassembling and Assembling PC <ul style="list-style-type: none"> • Introduction to computers, applications. Basic blocks of a digital computer. • Different types and specifications of the cables and connectors used for interconnecting the devices, boards, cards, components inside a PC • Importance of SMPS, Hard disk, Internal and external memory devices • Different types of I/O 	6



		<ul style="list-style-type: none"> • Mount the mother board on cabinet • Connect Hard disk Drive, RAM, coolant fan, DVD/BD Drive and fix CMOS Battery • Connect the SMPS and add on cords • Assemble the cabinet. And connect the peripherals • Connect power cords and switch on power supply and run the PC 	1 1 1 1	<p>Devices (Monitors, Printers, Mouse, Keyboards, Scanners, Plotters, Speakers)</p> <p>Precautions to be taken while opening and closing PC cabinet.</p>	
1 (Cont ..)	Able to perform basic trouble shoot of PC (25-32Hrs)	Basic Trouble Shooting PC <ul style="list-style-type: none"> • Check PC Power Supply • SMPS cables and connections to the mother board • Check connection of I/O devices to PC • Remove and reinsert RAM and reinsert CMOS battery • Check HDD/DVD cables 	5 1 1 1 1 1	Basic Trouble Shooting PC Proper troubleshooting Techniques for motherboards, I/O Devices	3
	Able to work with different cables, connectors and its Crimping techniques for PC. (33-40)	Cables and Connectors <ul style="list-style-type: none"> • Connect SATA/IDE Cables to Hard Disk Drive • Crimp CAT 6 cable to RJ 45 connector • Connect peripherals (Keyboard, Mouse, USB drive, printer) to USB port • Connect SVGA/HDMI Cable to the system • Connect multimedia devices to AV Port 	5 1 1 1 1 1	Cables and Connectors <ul style="list-style-type: none"> • Importance of Cables SATA/IDE Cables, CAT 6 cables, SVGA/HDMI cables • Importance of RF connectors, USB ports, AV Ports 	3
2	Able to install and maintain software's for a PC. (41-56 Hrs)	Software Installation <ul style="list-style-type: none"> • Prepare Hard disk for OS installation by making partitions • Setup CMOS with desired parameters for hard disk and set date and time • Install Operating System Windows and Linux in two different partitions 	10 2 1 3 2	Software Installation <ul style="list-style-type: none"> • Distinguish between System Software and Application Software • Differentiate between Linux and Windows OS • Windows 32 bit, and 64 bit System • FDISK, Format, Scandisk, FAT System, NTFS and 	6



		<ul style="list-style-type: none"> • Create user accounts as administrator and guest • Install Device Drivers • Install/Uninstall Application software (Office, Multimedia and Antivirus) 	1 1	Directories, Fragmentation and defragmentation disk	
2 (Cont ..)	Able to manage files effectively in Windows and Linux environment (57-80 Hrs)	File Management <ul style="list-style-type: none"> • Draw sketches using paint for practice on mouse/touch pad • Draft a document using Note Pad for practice on Key Board • Create, save, rename, move, copy and delete files and folders. • Transfer files and folders from/to external storage devices • Create zip file • Extract the zip file • Create automatic backup • Hide/unhide files/folder • Create password for individual files 	15 2 3 2 1 1 1 2 1 2	File Management <ul style="list-style-type: none"> • Functions of Key board and Mouse • Applications MS Paint/Note pad • Different text formats • Different image file formats • Advantages of compressing files • Distinguish between backup and cloning 	9
3	Able to work with Linux environment by using Linux commands. (81-104 Hrs)	Linux Read terminal ID using TTY command to know which terminal we are working Execute the following Linux Commands <ul style="list-style-type: none"> • TTY Command, uname Command, Date, cal, Whoami, Man, Pwd, Whatis, Fdisk, Sudo, Ifconfig, Chmod, Umask, Adduser, Ping, Hostname, Dpkg -i • Touch, echo, clear, ls, Dir, Mkdir, Cat, Rmdir, Rm, Cp, Mv, Find, Head, Tail, Tar, Gzip, Bzip2, Alias, Sed, wc, sort. 	15 1 7 7	Linux <ul style="list-style-type: none"> • Introduction to Linux operating system • Familiarization with GUI environment • Syntax of shell commands 	9
3 (Cont ..)-4	Able to create document, spread sheets and make presentations using open office	Open Office <ul style="list-style-type: none"> • Draw sketches using paint • Create your resume using edit commands in document • Create purchase order using tables and images 	35 2 3 5	Open Office Familiarisation of open office tools for creating documents, spread sheet and presentation	21



	(105-160 Hrs)	<ul style="list-style-type: none"> • Create magazine using columns page borders, header footers • Create an invitation letter using mail merge for n invitees • Create mark sheet using spread sheet with data validation • Create chart for mark sheet • Create Pay slip using functions and formulae • Create Pivot table/chart for inventory management • Create Presentation by inserting charts, tables and images about organization 	2 3 3 2 5 5 5		
5	Able to customize PC in Windows and Linux environment (161- 200 Hrs)	PC customization (Windows/Linux) <ul style="list-style-type: none"> • Set the system date and time • Change the display properties for <ul style="list-style-type: none"> - Back ground - Resolution - Screen saver - Desktop icons - Gadgets • Personalise Taskbar for <ul style="list-style-type: none"> - Hide and Lock - Pin and unpin applications • Setting the control panel for <ul style="list-style-type: none"> - Add/remove hardware - Install/uninstall software - Change properties of peripheral devices - Enable system security - Language and region - Change input methods using language and region 	25 2 8 5 10	PC customization (Windows/Linux) <ul style="list-style-type: none"> • Concept of GUI, Modes of starting on different occasions. • Desktop, Icon, selecting, choosing, drag and drop. My computer • Recycle bin, task bar, start menu, tool bar, and menus. • Windows Explorer. Properties of files and folders. • Applications under windows/linux accessories. • Windows/Linux Help. • Finding files, folders, computers. • Control panel. Installed devices and properties. 	15
6	Able to manage PC in Window/Linux environment (201-240 Hrs)	PC Management <ul style="list-style-type: none"> • Create and format partitions, volumes, assigning drive letters using disk part command • Browse and Manage event logs using event viewer • Schedule and maintain automated tasks at specific time 	25 3 2 1	PC Management Familiarisation with <ul style="list-style-type: none"> • Disk management • Task scheduler • Even viewer • Device manager • Shared folders • Services and applications 	15



		<ul style="list-style-type: none"> using task scheduler • Install and update the drivers for hardware devices using device manager • Stop/start service using SC config command • Create file shares and set permission • Share files to different users and manage • Start/stop application using task manager • Monitor PC performance using task manager • Close programs which are not responding using task manager <p>Anti Virus</p> <ul style="list-style-type: none"> • Install anti virus • Run a full system scan • Fix browser from redirecting to other websites (browser hijack) • Blocking un-trusted network • Block social network websites 	<p>3</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p>	<p>Virus</p> <p>Different types of virus an anti virus</p> <p>Using different types of firewalls - pocket firewalls, State-full firewalls, Application layer firewalls and Proxy firewalls</p>	
7-8	Able to perform troubleshooting and maintenance of PC based on the faulty condition. (241-320 Hrs)	<p>Hardware Maintenance</p> <p>Service of Dead PC</p> <ul style="list-style-type: none"> • Check power cable continuity • Check SMPC DC output, check cables and connectors • Check cabinet power on button <p>Service CPU ON and no display</p> <ul style="list-style-type: none"> • Check DC power supply from SMPS to mother board • Remove sound cord if any and check for restoration of booting process • Check for proper insertion of RAM • Check for dust on mother board • Replace SVGA cord with new one • Check for any crack on mother board PC 	<p>50</p> <p>5</p> <p>5</p>	<p>Hardware Maintenance</p> <ul style="list-style-type: none"> • Explain and apply common prevention methods • Explain Service Flow Sequence (SFS) and Trouble Shooting Chart (TSC) of PC • Safety precautions in handling PC, sub assemblies and components, Important points to be considered while purchasing and replacing components. Concept of Preventive and corrective maintenance. Tools required, Active & Passive Maintenance, Maintenance scheduling. Need of diagnostics 	30



	<ul style="list-style-type: none"> • Check for overheating of any ICs on mother board • Replace BIOS <p>Service if system is frequently restarting</p> <ul style="list-style-type: none"> • Replace the RAM • Check for any boot virus • Check all the connections of mother board <p>Service if system gives continuous beep sound</p> <ul style="list-style-type: none"> • Check for proper insertion of RAM • Check for dust on mother board • Replace SVGA cord with new one <p>Service if System not Booting</p> <ul style="list-style-type: none"> • Check SATA/IDE cable and SMPS • Check HDD partition problem • Check CMOS battery voltage • Check HDD parameters in CMOS setup • Check for boot virus <p>Service if OS not loading</p> <ul style="list-style-type: none"> • Check RAM • Check proper installation of Driver Software in device manager • Uninstall recently performed drivers • Boot in safe mode <p>Service if system gets frequently hanging</p> <ul style="list-style-type: none"> • Check for proper working of CPU cooler fan • Check for dust in mother board • Run chkdisk • Check for boot virus 	<p>5</p> <p>5</p> <p>10</p> <p>5</p> <p>5</p>	<p>program. Features, limitations. Examples of commonly used diagnostic programs.</p> <ul style="list-style-type: none"> • Types of monitor, Monochrome and colour, CGA, EGA, VGA, SVGA, Digital Analogue, interlaced non interlaced. Specifications and comparison • Main components and connectors on display cards, display controller IC, RAM chips and dual port feature principle of working and use of display memory. • LCD and TFT Monitors. • Understanding the difference between flat screens and CRT display systems • Understanding the display memory and its effect on quality and performance 	
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		<ul style="list-style-type: none">• Boot in safe mode• Reload OS <p>Service if system is very slow</p> <ul style="list-style-type: none">• Close all opened applications• Run MSconfig and remove unwanted startup applications• Check virus affect on OS• Run Chkdisk <p>Troubleshoot if paper is jam in printer</p> <ul style="list-style-type: none">• Check for any loose components in feed assembly• Check for any blockage in paper eject assembly• Check if paper put tray is full• Check paper pick up sensor• Check paper pick up roller for any damage• Check in cartridge access cover• Remove and insert cartridge	5		
			5		



Syllabus for Diploma in “IT, Networking and Cloud”					
Core Module 2 : Computer Networking : 320 Hrs					
Week No.	Learning outcome	Professional Skills (Trade Practical)	No. of Hrs	Professional Knowledge (Trade Theory)	No. of Hrs
9	Able to understand basic computer network technology. (321-360 Hrs)	Crimp and connect Cable <ul style="list-style-type: none"> • Crimp Straight Cable using Different Color Codes • Crimp Cross Cable using Different Color Codes • Crimp Rj45 connector with Straight and Cross cable • Check signal transmission using LAN TESTER • Install and configure Peer to Peer connection. • configure IP Address 	25 5 5 3 2 5 5	Overview of Networking Introduction to networks, LAN, VLAN, CAN, MAN, WAN, Internet and Intranet etc. Uses and benefits of Network, Server-client based network, peer to peer networks. Network Interface Card, Crimping tools and Color standards for Straight crimping and Cross crimping	15
10	Able to understand and configure server environment and backup services. (361-400Hrs)	Server Configuration & Backup <ul style="list-style-type: none"> • Install and configure Server-Client Network (5 Hrs) • Install and Configure Windows Server (5 Hrs) • Configure a server as web server (5 Hrs) • Configure Mailbox Server (2 Hrs) • Backup and Restore ADS and DHCP (3 Hrs) • Backup and Restore User Data (2 Hrs) • Permit FAT and NTFS Sharing (3 Hrs) 	25 5 5 5 2 3 2 3	Transmission Media and Topologies Media types: Concept of Server, client, node, segment, backbone, host etc. Analog and Digital transmission STP cable, UTP cable, Coaxial cable, Fiber cable, Base band and Broadband transmission, Cables and Connectors, Physical and logical topologies, Bus, Star, Ring and Mesh topologies. Concept of Asynchronous & Synchronous Transmission	15
11	Able to configure different protocol services.	Plan and Implement User and Group Strategies <ul style="list-style-type: none"> • Add Account • Implement AGDLP Process • Implement User Authentication 	25 1 2 2	Implement User and Group Strategies <ul style="list-style-type: none"> • User Authentication Strategy • OU Structure 	15



	(401-440 Hrs)	<p>Strategy</p> <ul style="list-style-type: none"> • Plan and Implement OU Structure • Plan and Maintain Group Policies • Configure User Environment <p>Protocols and Services</p> <ul style="list-style-type: none"> • Install and Configure Active Directory Services • Installation and Configuring DNS Services • Installation and Configuring DHCP Services • Install and Configure FTP Services. • Install and Configure HTTP Services • Configure IIS Services 	<p>1</p> <p>2</p> <p>2</p> <p>2</p> <p>3</p> <p>2</p> <p>3</p> <p>2</p> <p>3</p>	<ul style="list-style-type: none"> • User Environment • Group Policies • AGDLP Process <p>Protocols and Services</p> <ul style="list-style-type: none"> • TCP/IP,HTTP, FTP,SMTP and other Different types of protocols • OSI Model • Media Access Method • DNS services • DHCP services • WINS services • RAS services • Web services • Proxy Services. 	
12	Able to Install and configure Linux server environment. (441-480 Hrs)	<p>Linux Server installation and configuration</p> <ul style="list-style-type: none"> • Install Linux Server • Create new user and group • Create public and data directory • Create an lmlhosts file • Check host file • Filter ports • Secure and run SWAT • Install and configure Telnet 	<p>25</p> <p>3</p> <p>2</p> <p>2</p> <p>3</p> <p>2</p> <p>3</p> <p>5</p> <p>5</p>	<p>Linux Server installation and configuration</p> <ul style="list-style-type: none"> • Configuration Plan • Public and data directory • Host file • SWAT • Password 	15
13	Able to Install & configure the different types of network devices in a network. (481-520 Hrs)	<p>Network Devices</p> <ul style="list-style-type: none"> • Configure & Implement Unmanageable Network Switch • Configure & Implement Manageable Network Switch • Install and configure router, bridges and HUB • Configure Wireless Access Point • Install and Configure Wire Network • Install and Configure Wireless Network 	<p>25</p> <p>3</p> <p>2</p> <p>3</p> <p>2</p> <p>2</p> <p>2</p>	<p>Network Devices(15 hrs)</p> <ul style="list-style-type: none"> • Functions of NIC • Repeaters • Hub • Switches • Routers • Bridges. • Internet service provider 	15



		<ul style="list-style-type: none"> • Install of AD-hoc Wireless Network 	1		
		<p>Manage Broad Band</p> <ul style="list-style-type: none"> • Configure Gateway Service for Internet Connectivity • Configure ADSL+2 Router for ISP Internet Connectivity • Troubleshoot Internet Connectivity 	3 2 5		
14	Able to configure and manage network security. (521-560Hrs)	<p>Network Security</p> <ul style="list-style-type: none"> • Managing Server Network Security • Set up security base line • Configure Audit Policy • Monitor and Troubleshoot Network protocol • Configure Protocol Security • Plan security for Wireless Network • Install and Configure Different Antivirus Software Install and • Configure Admin Console • Configure a Local Security Policies • Configure Domain Security Policies • Configure RRAS Policies 	<p>25</p> 3 2 2 3 2 1 2 3 2 3 2	<p>Network Security</p> <ul style="list-style-type: none"> • Modern Network Security Threats and the basics of securing a network. • Secure Administrative Access • LAN security considerations. • Network Security Devices. 	15
15	Able to configure and perform remote accessing & routing. (561-600 Hrs)	<p>Remote Access</p> <ul style="list-style-type: none"> • Manage TCP/IP Routing • Configure Remote Access Authentication Protocol • Connect remote Desktop using Remote Assistance • Connect Remote Desktop using Telnet • Connect Remote Desktop using HyperTerminal • Connect Remote Desktop using Team Viewer 	<p>25</p> 5 5 5 3 2 5	<p>Remote Access</p> <ul style="list-style-type: none"> • Overview of Remote Access • VPN Concepts. • Remote Access Authentication Protocol • TCP/IP Routing 	15
16	Able to get familiarize with internet and E-Commerce	<p>Internet and Web Browser</p> <ul style="list-style-type: none"> • Configure web browser • Search for content using 	<p>25</p> 2 1	<p>Internet and Web Browser</p> <ul style="list-style-type: none"> • Introduction to Search Engines, 	15



	sites.(600-640 Hrs)	<p>popular search engines</p> <ul style="list-style-type: none"> • Use favourite folder for browsing quickly • Download & Print Webpages • Create and send e-mail, Reply to an e-mail message and Forward email message • Send document/softcopy by email • Activate spell check using address book and Handle SPAM • Sorting and search emails. • Block emails using filter • Store download file in mail drives • Communicate using text, video chatting and social networking sites • Protect the computer against various internet threats <p>E Commerce</p> <ul style="list-style-type: none"> • Browse ecommerce website • Place order for items • Add items to shopping Carts • Do online payment through payment gateways or other payment method • Do online Bill payment of service providers 	<p>1</p> <p>1</p> <p>3</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p> <p>2</p> <p>2</p> <p>3</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<ul style="list-style-type: none"> • Popular Search engines. • Concept of Favourites Folder. • What is an Electronic Mail. • Email Addressing, BCC and CC, Inbox, Outbox, Address book, SPAM. • Introduction to video chatting tools. • Introduction to Internet Security, Threats and attacks, Malicious Software types, Internet security products and their advantages. • IT Act & Law Introduction to Cyber Security. Introduction to Cyber Laws & IT Act. Importance of privacy and techniques to manage it. <p>E Commerce</p> <ul style="list-style-type: none"> • Definition of E commerce, Types, scope and benefits of E commerce. • Difference between E commerce and traditional commerce. • Capabilities requirements and Technology issues for E commerce. • Types of E commerce web sites. • Building business on the net. • Concepts of on line Catalogues, Shopping carts, Checkout pages. • Payment and Order Processing, Authorization, Chargeback and other payment methods. <p>Security issues and payment gateways.</p>	
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Syllabus for Diploma in “IT, Networking and Cloud”					
Core Module 3 : Web Designing : 320 Hrs					
Week No.	Learning outcome	Professional Skills (Trade Practical)	No. of Hrs	Professional Knowledge (Trade Theory)	No. of Hrs
17	Able to create simple web pages using HTML 5. (641-656 Hrs)	Hyper Text Mark Up Language (HTML) - <ul style="list-style-type: none"> • Create HTML document using mark up Tags in HTML editor (Note pad) • Open/run the html file in web browser to check the output • Modify above HTML document using heading – paragraphs • Modify above HTML document using Line Breaks • Modify above HTML document using HTML Tags Skills on elements of HTML <ul style="list-style-type: none"> • Create Text, Lists, Tables and Frames • Create Hyperlinks, Images and Multimedia Working with Forms and controls. 	10 1 1 1 1 1 2 3	Hyper Text Mark Up Language (HTML) - <ul style="list-style-type: none"> • Introduction to Internet, browsing, emailing • Introduction to HTML • Different editors used for Webpage Developing - Phase 5 HTML Editor, Programmer’s Notepad, SynWrite Editor, PlainEdit.net, Notepad++, jEdit HTML Editor, Sublime Text 2, Sublime Text 2: unofficial documentation, Package Control: packet manager for Sublime Text 2, Adobe Brackets • Application of HTML 	6
17 (Cont ..)	Able to create Styles of web pages using CSS. (657-680 Hrs)	Cascaded Style Sheet (CSS) <ul style="list-style-type: none"> • Create CSS document by using ID selector • Create CSS document by using Class selector, Universal selector and Grouping selector • Create CSS document with fonts : Bold, Italics, oblique • Design Style sheet document with text transformation : Uppercase, Lower case and capitalize • Create CSS document with font size in different pixels • Create CSS document with font weight thinner, thicker, 	15 1 1 1 1 1 1	Cascaded Style Sheet (CSS) <ul style="list-style-type: none"> • Introduction to CSS • Limitations of CSS • Advantages of CSS • Three ways to integrate CSS • Merits and demerits of - external Style Sheets, Embedded Style Sheets 	9



		<p>bold</p> <ul style="list-style-type: none"> • Create CSS document with alignment centre, right and left • Create CSS document with background colours and font colours • Create CSS document with text hovering • Create CSS document with text decoration • Create CSS document with block elements and objects • Create Lists and Tables • Create Box Model by using borders, Padding and Margin • Create CSS document by Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute selector) • Creating page Layout and Site Designs. 	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>		
18	Able to create own account in cloud and hosting.(681-720 Hrs)	<p>Cloud Computing</p> <ul style="list-style-type: none"> • Install Web server in Cloud • Creating own account in cloud and launch and track no. of visitors • Hosting in Amazon Web 	<p>25</p> <p>5</p> <p>10</p> <p>10</p>	<p>Cloud Computing</p> <p>Introduction cloud computing, Amazon web server (AWS) Industrial Faculty-webinar How cloud and Webinar works</p>	25
19-20	Able to configure embedded database with different web pages using Mongo DB (721-800 Hrs)	<p>DBMS with Mongo DB</p> <ul style="list-style-type: none"> • Install of MongoDB in the system • Create data with the following Data types – String, Integer, Boolean, double, min/max keys, arrays, timestamp, object, Null, symbol, date, object ID, Binary data, Code, Regular Expression • Insert Document in database • Update document in database • Delete document in database • Project document in document • Create a MongoDB query to 	<p>50</p> <p>2</p> <p>3</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>5</p>	<p>Basic Concepts of DBMS</p> <ul style="list-style-type: none"> • Purpose of database systems – Data abstraction – Database Users – Data Independence (Logical & Physical) – Instance & Schemes – Three layered Architecture of DBMS – Different Levels of Abstraction. • DATA MODELLING, E-R MODELLING • LOGICAL MODELS: Object & Record based – Object oriented model – Entity relationship 	30



		<p>display all the documents in the collection data (Trainees data)</p> <ul style="list-style-type: none"> • Create a MongoDB query to display the fields id, trainee name, lab name, Certificate No., course title, course starting date, course ending date for all the documents in the collection trainees data. • Create a MongoDB query to display the fields id, trainee name, lab name, Certificate No., course name, course starting date, course ending date for all the documents in the collection trainees data, but excluding lab name • Create a MongoDB query to display all the trainees who attended course on PHP • Create a MongoDB query to display the 1st batch trainees of PHP • Create a MongoDB query to display the 2nd batch trainees of PHP • Create a MongoDB query to find the course where maximum trainees attended • Create a MongoDB query to find lab wise details of trainees • Create a MongoDB query with course wise details of trainees • Print the queries 	<p>5</p> <p>5</p> <p>2</p> <p>3</p> <p>2</p> <p>3</p> <p>5</p> <p>5</p> <p>5</p>	<p>models – Entity sets & relationships sets – Attributes — KEYS in entity & relationship sets: (a) super key, (b) candidate key, (c) primary key, (d) unique key — Mapping constraints – E-R Diagrams –Relational Model – Hierarchical model – Network Model.</p> <ul style="list-style-type: none"> • RELATIONAL DATABASE MANAGEMENT, RELATIONAL ALGEBRA & RELATIONAL CALCULUS <p>RDBMS Technology, The relational Data Structure, Keys, Relational Data Manipulation, The Relational Algebra, Relational algebraic Operations, The Set Operations, Fundamental Operations, Relational Calculus. Data definition language – Data manipulation language – Relational algebra — OPERATORS: select, project, join, rename etc – Simple examples. Introduction to Mongo DB, Advantages of Mongo DB over RDBMS</p>	
21-22	Able to design and develop dynamic websites with PHP.	<p>PHP (Hyper Text pre processor) (50 hrs.) <u>Handling Html Form With PHP</u></p> <ul style="list-style-type: none"> • Capturing Form Data Dealing with Multi-value filed 	<p>50</p> <p>3</p>	<p>PHP(Hyper Text pre processor)</p> <ul style="list-style-type: none"> • Decisions and loop - Making Decisions, Doing Repetitive task with 	30



	(801-880 Hrs)	<p>Generating File uploaded form</p> <ul style="list-style-type: none"> • Redirecting a form after submission • Write a PHP script to get the PHP version and configuration information • Write a PHP script to display the strings • Create a simple HTML form and accept the user name and display the name through PHP echo statement • Write a e PHP script to display string, values within a table • Write a PHP script to count lines in a file • Write a PHP function to test whether a number is greater than 30, 20 or 10 using ternary operator • Write a script which will display the string • Write a PHP script which will display the colors • Write a PHP script to sorting • Write a PHP script to calculate and display average temperature, five lowest and highest temperatures in given data • Write a program to calculate and print the factorial of a number using a for loop • Write a PHP script using nested for loop • Write a PHP program to generate and display the first n lines of a Floyd • Write a function to calculate the factorial of a number • Write a function to check a number is prime or not • Write a function to reverse a string 	<p>2</p> <p>2</p> <p>3</p> <p>2</p> <p>3</p> <p>2</p> <p>3</p> <p>2</p> <p>3</p> <p>3</p> <p>3</p> <p>2</p> <p>2</p> <p>3</p> <p>2</p> <p>1</p>	<p>looping, Mixing Decisions and looping with Html</p> <ul style="list-style-type: none"> • Function - What is a function ,Define a function, Call by value and Call by reference, Recursive function • String - Creating and accessing String Searching & Replacing String Formatting String ,String Related Library function • Array - Anatomy of an Array ,Creating index based and Associative array, Accessing array Element, Looping with Index based array, Looping with associative array using each() and for each (), Some useful Library function • Working with file and Directories - Understanding file& directory Opening and closing a file Coping, renaming and deleting a file, Working with directories Building a text editor File Uploading & Downloading, Using query string(URL rewriting), Using Hidden field ,Using cookies, Using session . • String matching with regular expression What is regular expression, Pattern matching in PHP, Replacing text, Splitting a string with a Regular Expression • Generating Images with PHP - Basics of computer 	
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		<ul style="list-style-type: none"> • Write a PHP function that checks whether a passed string is a palindrome or not? • Write a simple PHP class which displays the given string • Write a PHP Calculator class which will accept two values as arguments, then add them, subtract them, multiply them together, or divide them on request • Write a PHP script to : - a) transform a string all uppercase letters. b) transform a string all lowercase letters. c) make a string's first character uppercase. d) make a string's first character of all the words uppercase 	1 2 2 5 5	<p>Graphics</p> <p>Creating Image</p> <p>Manipulating Image</p> <p>Using text in Image</p> <ul style="list-style-type: none"> • Database Connectivity with MySql 	
23-24	Able to make websites, web servers, game frameworks, desktop and CLI applications, and IDE using Python. (881-960 Hrs)	<p>Python</p> <ul style="list-style-type: none"> • Install Python software in the system • Print a string using print statement • Print given string using indentation (space between characters) • Define Integer Variables, floating variables and string variables • Write a program to add numbers and strings to the correct list using the append list method • Write a python program to add, subtract, multiply and divide given two numbers by using arithmetic operators • Write a python program multiplying strings to form string with repeating sequence • Write a Python program to get the largest number from a list by using max and mini commands 	50 2 2 1 1 2 2 2 1 2	<p>Python</p> <p>Introduction to Python</p> <p>History, Features, Setting up path</p> <p>Basic Syntax Variable and Data Types Operator, Conditional Statements, Looping, Control Statements, String Manipulation, Lists, Tuple, Functions and Methods, Dictionaries, Functions, Modules, Input and Out Put. Exception Handling.</p>	30



	<ul style="list-style-type: none"> • Write a Python program to find whether a given number (accept from the user) is even or odd by using if else command • Write a Python program to create a histogram from a given list of integers by using for while loop • Write a Python program to compute the greatest common divisor (GCD) of two positive integers by using loops • Write a Python program to get the least common multiple (LCM) of two positive integers using if else and while commands • Write a Python program to sort (ascending and descending) a dictionary by value • Write a Python program to create a tuple. • Write a Python program to create a tuple with different data types • Write a Python program to create a set • Write a Python program to add member(s) in a set • Write a Python program to find maximum and the minimum value in a set. • Write a Python program to find the length of a set • Write a Python program to convert temperatures to and from Centigrade to Fahrenheit • Write a python program to find Fibonacci series • Write a python program to find factorial using function • Write a python program to find whether the given string is palindrome or not by using 	<p>1</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p>		
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		function		
		• Write a python class to reverse a string word by word	2	
		• Write a python class named as circle by a radius and two methods of computer area and perimeter of a circle	3	
		• Write a python program to sort a list of elements using bubble sort algorithm	2	
		• Write a python program to copy content of a file to another file	3	
		• Write a python program to find the frequency of words in a file	2	



Syllabus for Diploma in “IT, Networking and Cloud”					
Core Module 4 : Web Development : 320 Hrs					
Week No.	Learning outcome	Professional Skills (Trade Practical)	No. of Hrs	Professional Knowledge (Trade Theory)	No. of Hrs
25-26	Able to understand how web works (961-984 Hrs)	Exercise duration <ul style="list-style-type: none"> • Create web page content using HTML (Hyper Text Mark up Language) Tags • Enable Hypertext Transfer Protocol (HTTP) via GET and POST requests • Obtain input from users. 	15 5 5 5	Theory duration:9 hrs. <ul style="list-style-type: none"> • Learn basic concepts regarding the internet, browsers, and HTML. • Use of HTML (Hyper Text Mark up Language) in web pages. • Protocols • Forms and Input • Database • User Account and security • APIs and Caching. 	9
25-26	Structuring the web (985-1040 Hrs)	Exercise duration <ul style="list-style-type: none"> • Divide a webpage into logical sections • Set up a proper structure of headings and paragraphs • Display computer code with HTML • Annotation of images and graphics. • Marking abbreviations • Add quotations and citations to web pages • Embed a webpage within another webpage • Add Flash content within a webpage • Create a data spreadsheet • Create HTML tables • Optimize HTML table rendering • Create collapsible content with HTML • Add context menus to a webpage • Create of a dialog boxes with 	35 1 1 1 2 1 2 2 3 2 1 1 1 2 2	Theory duration <ul style="list-style-type: none"> • Introduction to HTML • Structuring of web page using HTML • Multimedia and embedding • HTML table and forms APIs 	21



		<p>HTML</p> <ul style="list-style-type: none"> • Add multiple languages into a single webpage • Controlling of HTML line breaking • Mark changes (added and removed text) • Add responsive image to a webpage • Add vector image to a webpage • Add a hit map on top of an image 	<p>2</p> <p>1</p> <p>2</p> <p>3</p> <p>3</p> <p>2</p>		
27-28	<p>Scripting and Styling the web (CSS) (1041-1120 Hrs)</p>	<p>Exercise duration</p> <ul style="list-style-type: none"> • Apply CSS within a webpage • Apply CSS to HTML • Select elements via element name, class or ID • Select elements via attribute name and content • Apply pseudo-elements • Specify colors in CSS • Debug CSS in the browser • style text and customize a list of elements • Add shadows to text • Size CSS boxes • Control overflowing content • Control the part of a CSS box to draw the background • Create fancy boxes (also see the Styling boxes module, generally). • Use background-clip to control the background image covers. • Change the box model completely using box-sizing • Control backgrounds • Apply control borders • Style an HTML table • Add shadows to boxes • Calculate specificity of a CSS selector • Control inheritance in CSS 	<p>50</p> <p>2</p> <p>3</p> <p>2</p> <p>1</p> <p>2</p> <p>2</p> <p>1</p> <p>2</p> <p>2</p> <p>2</p> <p>1</p> <p>2</p> <p>2</p> <p>1</p> <p>2</p> <p>2</p> <p>3</p> <p>2</p> <p>3</p> <p>2</p> <p>3</p> <p>2</p>	<p>Theory duration</p> <ul style="list-style-type: none"> • CSS overview • Syntax • CSS values and units • Styling text • Styling box • CSS layout 	30



		<ul style="list-style-type: none"> • Apply filters in CSS • Apply blend modes in CSS • Apply CSS multi-column layouts • Apply CSS generated content 	2 1 3 2		
29-30	Enhancing the web using PHP. (1121-1200 Hrs)	<p>Exercise duration:50 hrs.</p> <ul style="list-style-type: none"> • Create a form in PHP and apply validations. • Create a date and time from a number of parameters in mktime() • Create a date and time from the strtotime() function • Create more dates/times from strtotime() • Output the dates for the next six Saturdays • Output the number of days until 10th of July • Create and retrieve a cookie • Modify a cookie value • Delete a cookie • Check if cookies are enabled • Select data with MySQLi (Object-oriented) • Select data with MySQLi (Object-oriented) and put result in an HTML table • Select data with MySQLi (Procedural) • Select data with PDO (+ Prepared statements) 	50 5 2 2 1 3 2 5 2 1 2 5 10 5 5	<p>Theory duration</p> <ul style="list-style-type: none"> • PHP Fundamentals overview • PHP Forms, files and cookies • Form validations • Introduction to PHP Script • Looping statement in PHP Script • Working with Predefined functions • Maintaining Validations in PHP Script • Working with Different types of Mouse Events • Object Oriented Programming and PHP 5 • Debugging PHP Code • PHP Session Handling Features • Smarty installation • Handling Date & Time in PHP • Installing and Managing MySQL (access control & overview) • Understanding and using MySQL clients • Database Access, Design Patterns, Mail Function, PEAR and cURL 	30
31-32	Java: The key language (1201-1280 Hrs)	<p>Exercise duration</p> <ul style="list-style-type: none"> • Write a Java Programme to print Hello on Screen • Write a Java Program to find arithmetic Operations • Write a Java Program to find biggest no. in given three nos. • Write a java program to print 	50 2 1 2 2	<p>Theory duration</p> <ul style="list-style-type: none"> • Introduction to Java programming • The Java Virtual Machine • Variables and data types • Conditional and looping constructs Arrays 	30