Syllabus for Diploma in "IT, Networking and Cloud"		
Core Module 1: Computer Hardware & Networking (320 Hrs)		
Learning outcome	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
Able to use basic PC hand tools , cable and connnectors	**Skills on using Basic PC Hand Tools, cables and connectors (6 hrs)** 1. Remove screws using screw driver (0.5 Hrs) 2. Cut and Skin cables using cutting plier (0.5 Hr) 3. Desolder electronic components using desoldering pump, Remove electronic components using tweezers **(0.5 Hr)** 4. Solder electronic components **(0.5 Hr)** 5. Crimp CAT 6 cables using crimping tool **(0.5 Hr)** 7. Connect SATA/IDE Cables to Hard Disk Drive (0.5 Hr) 8. Crimp CAT 6 cable to RJ 45 connector (1 Hr) 9. Connect peripherals (Keyboard, Mouse, USB drive, printer) to USB port, Connect SVGA/HDMI Cable to the system (1 Hr) 10. Connect multimedia devices to AV Port (0.5 Hr)	**Hand Tools (3 Hrs)** • Specifications of Tweezers, Screw Driver, Cutting Pliers, Crimping Tool, Soldering Iron, De-soldering Pump ,Safety hazards on basic hand tools, Importance of Cables • SATA/IDE Cables, CAT 6 cables, SVGA/HDMI cables, Importance of RF connectors, USB ports, AV Ports

Able to Disassemble and assemble PC	**Disassembling PC (3 Hrs)** x Remove power cords and peripheral cables **(0.5 Hr)** x Remove the cabinet and identify the components, slots, sockets, and connectors of motherboards. **(0.5 Hr)** x Remove the SMPS **(0.5 Hr)** x Remove Hard disk Drive, RAM, CMOS Battery, coolant fan and DVD/BD Drive **(1 Hr)** x Remove add on cords Remove and clean the motherboard **(0.5 Hr)** **Assembling PC (3 Hrs)** x Mount the mother board on cabinet **(0.5 Hr)** x Connect Hard disk Drive, RAM, coolant fan, DVD/BD Drive and fix CMOS Battery **(0.5 Hr)** x Connect the SMPS and add on cords **(0.5 Hr)** x Assemble the cabinet. And connect the peripherals **(1 Hr)** x Connect power cords and switch on power supply and run the PC **(0.5 Hr)**	**Disassembling and Assembling PC (3 Hrs)** x Introduction to computers, applications. Basic blocks of a digital computer. x Different types and specifications of the cables and connectors used for interconnecting the devices, boards, cards, components inside a PC x Importance of SMPS, Hard disk, Internal and external memory devices x Different types of I/O Devices (Monitors, Printers, Mouse, Keyboards, Scanners, Plotters, Speakers) Precautions to be taken while opening and closing PC cabinet.
Able to install and maintain software's for a PC	**Software Installation (6 Hrs)** **1.** Prepare Hard disk for OS installation by making partitions **(2 Hrs)** 2. Install Operating System Windows and Linux in two different partitions **(2 Hrs)** 3. Install Device Drivers , x Install/Uninstall Application software (Office, Multimedia and Antivirus) **(2 Hr)**	**Software Installation (3 Hrs)** Distinguish between System Software and Application Software x Differentiate between Linux and Windows OS x Windows 32 bit, and 64 bit System x FDISK, Format, Scandisk, FAT System, NTFS and Directories, Fragmentation and defragmentation disk

Able to manage files effectively in Windows and Linux environment	**File Management (5 Hrs)** 1. Create, save, rename, move, copy and delete files and folders.**(1 Hrs)** 2. Transfer files and folders from/to external storage devices **(0.5 Hrs)** 3. Create zip file **(0.5 Hr)** 4. Extract the zip file **(0.5 Hr)** 5. Create automatic backup **(0.5 Hrs)** 6. Hide/unhide files/folders **(0.5 Hr)** 7. Create password for individual files **(0.5 Hrs)** 8. sort file, folders, change view of file and folders and various operation related to files and folders **(1)**	**File Management (2 Hrs)** x Functions of Key board and Mouse x Applications MS Paint/Note pad x Different text formats x Different image file formats x Advantages of compressing files x Distinguish between backup and cloning
Able to work with Linux environment by using Linux commands.	**Linux (17 hrs)** Read terminal ID using TTY command to know which terminal we are working **(1 Hrs)** Execute the following Linux Commands x TTY Command, uname Command, Date, cal, Whoami, Man, Pwd, Whatis, Fdisk, Sudo, Ifconfig, Chmod, Umask, Adduser, Ping, Hostname, Dpkg –i **(8 Hrs)** x Touch, echo, clear, ls, Dir, Mkdir, Cat, Rmdir, Rm, Cp, Mv, Find, Head, Tail, Tar, Gzip, Bzip2, Alias, Sed, wc, sort. **(8 Hrs)**	**Linux (8 hrs)** x Introduction to Linux operating system x Familiarization with GUI environment x Syntax of shell commands X Shell scripting

Able to create document, spread sheets and make presentations using open office	**Open Office (25 Hrs)** x Draw sketches using paint **(2 Hrs)** x Create your resume using edit commands in document **(2 Hrs)** x Create purchase order using tables and images **(3 Hrs)** x Create magazine using columns page borders, header footers **(2 Hrs)** x Create an invitation letter using mail merge for n invitees **(2 Hrs)** x Create mark sheet using spread sheet with data validation **(2 Hrs)** x Create chart for mark sheet **(2 Hrs)** x Create Pay slip using functions and formulae **(3 Hrs)** x Create Pivot table/chart for inventory management **(4 Hrs)** x Create Presentation by inserting charts, tables and images about organization **(3 Hrs)**	**Open Office (5 Hrs)** Familiarisation of open office tools for creating documents, spread sheet and presentation
Able to manage PC in Window/Linux environment	**PC Management (5 Hrs)** 1 .Create and format partitions, volumes, assigning drive letters using disk part command **(1 Hrs)** 2 Install and update the drivers for hardware devices using device manager **(1 Hrs)** 3. Create file shares and set permission **(1 Hr)** 4.Share files to different users and manage **(0.5 Hr)** 5. Start/stop application using task manager **(0.5 Hr)** 6. Monitor PC performance using task manager **(0.5 Hr)** 7. Close programs which are not responding using task manager **(0.5 Hr)**	**PC Management (3 hrs)** Familiarisation with x Disk management x Task scheduler x Even viewer x Device manager x Shared folders x Services and applications Virus Different types of virus an anti virus Using different types of firewalls - pocket firewalls, State-full firewalls, Application layer firewalls and Proxy firewalls

Able to perform troubleshooting and maintenance of PC based on the faulty condition	**Hardware Maintenance (25 hrs)** Service of Dead PC (4 Hrs) x Check power cable continuity x Check SMPC DC output, check cables and connectors x Check cabinet power on button Service CPU ON and no display (4 Hrs) x Check DC power supply from SMPS to mother board x Remove sound cord if any and check for restoration of booting process x Check for proper insertion of RAM x Check for dust on mother board x Replace SVGA cord with new one x Check for any crack on mother board PC x Check for overheating of any ICs on mother board x Replace BIOS Service if system is frequently restarting (4 Hrs) x Replace the RAM x Check for any boot virus x Check all the connections of mother board Service if system gives continuous beep sound (4 Hrs) x Check for proper insertion of RAM x Check for dust on mother board x Replace SVGA cord with new one Service if System not Booting (10 Hrs) x Check SATA/IDE cable and SMPS x Check HDD partition problem x Check CMOS battery voltage x Check HDD parameters in CMOS setup x Check for boot virus Service if OS not loading (4 Hrs) x Check RAM x Check proper installation of Driver Software in device manager x Uninstall recently performed drivers Boot in safe mode	**Hardware Maintenance (12 Hrs)** x Explain and apply common prevention methods x Explain Service Flow Sequence (SFS) and Trouble Shooting Chart (TSC) of PC x Safetyprecautions in handling PC, sub assemblies and components, Important points to be considered while purchasingand replacing components. Concept of Preventive and corrective maintenance. Tools required, Active & Passive Maintenance, Maintenance scheduling. Need of diagnostics program. Features, limitations. Examples of commonly used diagnostic programs. x Types of monitor, Monochrome and colour, CGA, EGA, VGA, SVGA, Digital Analogue, interlaced non interlaced. Specifications and comparison x Main components and connectors on display cards, display controller IC, RAM chips and dual port feature principle of working and use of display memory. x LCD and TFT Monitors. x Understanding the difference between flat screens and CRT display systems x Understanding the displays memory and its effect on quality and performance

	Service if system gets frequently hanging (5 Hrs) x Check for proper working of CPU cooler fan x Check for dust in mother board x Run chkdisk x Check for boot virus x Boot in safe mode x Reload OS Service if system is very slow (5 Hrs) x Close all opened applications x Run MSconfig and remove unwanted startup applications x Check virus affect on OS x Run Chkdisk Troubleshoot if paper is jam in printer (5 Hrs) x Check for any loose components in feed assembly x Check for any blockage in paper eject assembly x Check if paper put tray is full x Check paper pick up sensor x Check paper pick up roller for any damage x Check in cartridge access cover x Remove and insert cartridge	
Able to perform basic trouble shoot of PC	**Basic Trouble Shooting PC (5 Hrs)** x Check PC Power Supply **(1 Hr)** x SMPS cables and connections to the mother board **(1 Hr)** x Check connection of I/O devices to PC **(1 Hr)** x Remove and reinsert RAM and reinsert CMOS battery **(1 Hr)** x Check HDD/DVD cables **(1 Hr)**	**Basic Trouble Shooting PC (3 Hrs)** Proper troubleshooting Techniques for motherboards, I/O Devices
Networking		

Able to understand basic computer network technology.	Crimp and connect Cable(8 hrs) 1. Crimp Straight Cable using Different Color Codes (1 Hrs) 2. Crimp Cross Cable using Different Color Codes (1 Hrs) 3. Crimp Rj45 connector with Straight and Cross cable (1 Hrs) 4. Check signal transmission using LAN TESTER (1 Hrs) 5. Install and configure Peer to Peer connection. (2 Hrs) 6. configure IP Address (2 Hrs)	Overview of Networking (10 hrs) 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
Able to understand Basic Networking Concept	Server Configuration & Backup(10 hrs) 1. Install and configure Server-Client Network (2Hrs) 2.Backup and Restore User Data (2 Hrs) 3. Permit FAT and NTFS Sharing (2 Hrs). 4. Study of different type of cables (1 Hrs) 5. Design and configire Mesh topology in cisco packet tracer (1 Hrs) 6. Design and configire Ring topology in cisco packet tracer (1 Hrs) 7. Design and configire star topology in cisco packet tracer (1 Hrs)	Transmission Media and Topologies Media types:(15hrs) 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
Networking Protocol	Configure Network Protocol (10 Hrs) 1. Enable/disable DHCP from Network setting in PC (1 Hrs) 2. Configure IPv4 and IPv6 (1 Hrs) 3. Configure TCP/ IP (2Hrs) 4. Install and Configure FTP Services. (3 Hrs) 5 Install and Configure HTTP Services (2 Hrs)	Protocols and Services (5 Hrs) 1. TCP/IP,HTTP, FTP,SMTP and other Different types of protocols 2. OSI Model 3. Media Access Method 4. DNS services 5. DHCP services 6. WINS services 7. Web services 8.Proxy Services.

Able to Install & configure the different types of network devices in a network.	**Network Devices(25 hrs)** 1. Configure & Implement Unmanageable Network Switch (2 Hrs) 2. Configure & Implement Manageable Network Switch (2 Hrs) 3. Configuring and Troubleshooting a Switched Network (1 hrs) 3. Install and configure router, bridges and HUB (3 Hrs) 4. Configure Wireless Access Point (2 Hrs) 5. Install and Configure Wire Network (2 Hrs) 6. Install and Configure Wireless Network (2 Hrs) 7. Install of AD-hoc Wireless Network (1 Hr) Manage Broad Band 8. Configure Gateway Service for Internet Connectivity (3 Hrs) 9. Configure ADSL+2 Router for ISP Internet Connectivity (2 Hrs) 10. Troubleshoot Internet Connectivity (5 Hrs)	**Network Devices(15 hrs)** 1. Functions of NIC 2. Repeaters 3. Hub 4. Switches 5. Routers 6. Bridges. 7. Internet service provider
Able to configure and manage network security.	**Skills on Network Security(25 hrs)** 1. Managing Server Network Security (3 Hrs) 2. Set up security base line (2 Hrs) 3. Configure Audit Policy (2 Hrs) 4. Monitor and Troubleshoot Network protocol (3 Hrs) 5. Configure Protocol Security (2 Hrs) 6. Plan security for Wireless Network (1 Hr) 7. Install and Configure Different Antivirus Software (2 Hrs) 8. Install and Configure Admin Console (3 Hrs) Configure a Local Security Policies (2 Hrs) 9. Configure Domain Security Policies (3 Hrs) 10. Configure RRAS Policies (2 Hrs)	**Network Security(15 hrs)** 1. Modern Network Security Threats and the basics of securing a network. 2. Secure Administrative Access 3. LAN security considerations. 4. Network Security Devices.

Able to configure and perform remote accessing & routing.	**Remote Access(25 hrs)** 1 Manage TCP/IP Routing (5 Hrs) 2 Configure Remote Access Authentication Protocol (5 Hrs) 3 Connect remote Desktop using Remote Assistance (5 Hrs) 4 Connect Remote Desktop using Telnet (3 Hrs) 5 Connect Remote Desktop using HyperTerminal (2 Hrs) 6 Connect Remote Desktop using Team Viewer (5 Hrs)	**Remote Access (15 hrs)** 1. Overview of Remote Access 2. VPN Concepts. 3. Remote Access Authentication Protocol 4. TCP/IP Routing

Syllabus for Diploma in "IT, Networking and Cloud"		
Core Module 2 : Web design and Development : (320Hrs)		
Learning outcome	**Professional Skills (Trade Practical) (200 hrs)**	**Professional Knowledge (Trade Theory) (120 hrs)**
Able to create simple web pages using HTML 5 and understand how web works	**HyperText Markup Language (HTML) - (45 Hrs)** x Create HTML document using mark up Tags in HTML editor (Notepad) (Open/run the html file in web browser to check the output (30 mins) x Modify above HTML document using heading – paragraphs, Modify above HTML document using Line Breaks , Modify above HTML document using HTML Tags. (30 mins) x Introduce new elements of HTML5 (1 hrs) x Create Text, Lists, Tables and iFrames (2 Hrs) x Create Hyperlinks, Images and Multimedia Working with Forms and controls. (3 Hrs) x Enable Hypertext Transfer Protocol (HTTP) via GET and POST requests (1 Hrs) x Obtain input from users. (5 Hrs)	**HyperText MarkUp Language (HTML) - (20 Hrs)** Introduction to Internet, browsing, emailing x Introduction to HTML x 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 x Application of HTML x Protocols x Forms and Input x Database x User Account and security x APIs and Caching.
Structuring the web	x Divide a webpage into logical sections (1 Hr) x Display computer code with HTML (1 Hr) x Annotation of images and graphics. (2 Hr) x Marking abbreviations (1 Hr) x Add quotations and citations to web pages (2 Hrs) x Embed a webpage within another webpage (2 Hrs) x Create a data spreadsheet (2 Hrs) x Optimize HTML table rendering (1 Hr) x Create collapsible content with HTML (1 Hr) x Add context menus to a webpage (2 Hr) x Create dialog boxes with HTML (2 Hrs) x Add multiple languages into a single webpage (2 Hrs) x Controlling of HTML line breaking (1 Hrs) x Mark changes (added and removed text) (2 Hrs) x Add responsive image to a webpage (3 Hrs) x Add vector image to a webpage (3 Hrs) x Add a hit map on top of an image (2 Hrs) x Animation (1 hr) x Transform (1 hr)	

Able to create Styles of web pages using CSS.	**Cascaded Style Sheet (CSS) - (15 Hrs)** x Create CSS document by using ID selector (1 Hr) x Create CSS document by using Class selector, Universal selector and Grouping selector (1 Hr) x Create CSS document with fonts : Bold, Italics, oblique (1 Hr) x Design Style sheet document with text transformation : Uppercase, Lower case and capitalize (1 Hr) x Create CSS document with font size in different pixels (1 Hr) x Create CSS document with font weight thinner, thicker, bold (1 Hr) x Create CSS document with alignment centre, right and left (1 Hr) x Create CSS document with background colours and font colours (1 Hr) x Create CSS document with text hovering (1 Hr) x Create	**Cascaded Style Sheet (CSS) - (25 Hrs)** x Introduction to CSS x Limitations of CSS x Advantages of CSS x Three ways to integrate CSS x Merits and demerits of - external Style Sheets, Embedded Style Sheets x Syntax x CSS values and units x Styling text x Styling box x CSS layout

	CSS document with text decoration (1 Hr) x Create CSS document with block elements and objects (1 Hr) x Create Lists and Tables (1 Hr) x Create Box Model by using borders, Padding and	
Scripting and Styling the web (CSS)	**Exercise duration: (50hrs)** x Apply CSS within a webpage (2 Hrs) x Apply CSS to HTML (3 Hrs) x Select elements via element name, class or ID (2 Hrs) x Select elements via attribute name and content (1 Hrs) x Apply pseudo-elements (2 Hrs) x Specify colors in CSS (2 Hrs) x Debug CSS in the browser (1 Hrs) x Style text and customize a list of elements (2 Hrs) x Add shadows to text (2 Hrs) x Size CSS boxes (2 Hrs) x Control overflowing content (1 Hr) x Control the part of a CSS box to draw the background (2 Hrs) x Create fancy boxes (also see the Styling boxes module, generally). (2 Hrs) x Use background-clip to control background image (1 Hrs) x Change the box model completely using boxsizing (2 Hrs) x Control backgrounds (3 Hrs) x Apply control borders (2 Hrs) x Style an HTML table (3 Hrs) x Add shadows to boxes (2 Hrs) x Calculate specificity of a CSS selector (3 Hrs) x Control inheritance in CSS (2 Hrs) x Apply filters in CSS (2 Hrs) x Apply blend modes in CSS (1 Hr) x Apply CSS multi-column layouts (3 Hrs) x Apply CSS generated content (2 Hrs)	

Javascript	**Exercise duration- (50 hrs)** Write a JavaScript function that reverse a number. (30 mins) x Write a JavaScript function that returns a passed string with letters in alphabetical order. (30 mins) x Write a JavaScript function that accepts a string as a parameter and counts the number of vowels within the string. (1 hr) x Write a JavaScript function that accepts a string as a parameter and converts the first letter of each word of the string in upper case. (1 hr) x Write a JavaScript program to calculate number of days left until next Christmas. (1 hr) x Write a JavaScript conditional statement to find the sign of product of three numbers. Display an alert box with the specified sign. Sample numbers : 3, -7, 2 Output : The sign is - (1 hr) x Write a simple JavaScript program to join all elements of the following array into a string. Expected Output : "Red,Green,White,Black" "Red,Green,White,Black" "Red+Green+White+Black" (1 hr) x Write a JavaScript function to check whether an `input` is an array or not.(1 hr) x Write a JavaScript function to clone an array. Test Data : [1, 2, 4, 0] [1, 2, [4, 0]] (1 hr)	**Introduction to Javascript (30 hrs)** Javascript DataType & Operator Javascript Condition & Loop Control statement JavaScript Array & Object JavaScript Function predefined JavaScript Function user Define JavaScript Event Programming Exception Handling BOM,Navigation,Settimeout,timeinterval Date,& Ajax JSON

	x Write a JavaScript program to sort the items of an array. Sample array : var arr1 = [3, 8, 7, 6, 5, -4, 3, 2, 1]; Sample Output : -4,-3,1,2,3,5,6,7,8 (1 hr) x Write a JavaScript program to display the colors in the following way : Here is the sample array: color = ["Blue ", "Green", "Red", "Orange", "Violet", "Indigo", "Yellow "]; o = ["th","st","nd","rd"] Output "1st choice is Blue ." "2nd choice is Green." "3rd choice is Red." (2 hr) x Create the following four functions in a separate JavaScript file. Also create+B13 a separate HTML file to test the functions. a) Create a function that uses an alert to display the hostname of the current URL when the button is clicked. b) Create a function to display a confirmation box with the message "Are you human?", and output what the user clicked c) Display a prompt box which asks the user for her/his name, store the user's response in person, and output a message; "Hello " + person + "! How are you today?" d) Use the switch statement together with prompt() to execute a block of code based on user input. Click the button to display a dialog box which will ask for the user's favourite drink. (3 hr) x Write a JavaScript function to remove specified number of characters from a string. (1 hr) Develop and demonstrate a HTML5 file that includes JavaScript script that uses functions for the following problems: a. Parameter: A string Output: The position in the string of the left-most vowel b. Parameter: A number Output: The number with its digits in the reverse order (2 hr) Write a JavaScript code that displays text "TEXT-GROWING" with increasing font size in the interval of 100ms in RED COLOR, when the font size reaches 50pt it displays "TEXT-SHRINKING" in BLUE color. Then the font size decreases to 5pt. (3 hr) x Create a Tip Calculator as a single page web application (SPA). Design an interface that allows you to enter the amount of the tip. The percentage you would like to tip, and the number of people to split the tip with. Do not use 3 text input elements! Calculate and dynamically display the tip.(3 hr) x Write a JavaScript function to validate whether a given value is object or not. (1 hr) x Write a JavaScript function to validate whether a given value type is pure json object or not. (1 hr) Write a JavaScript program to count number of words in string. Note : - Remove white-space from start and end position. - Convert 2 or more spaces to 1. - Exclude newline with a start spacing. (3 hr)	

	Write a JavaScript function to check a given value contains alpha, dash and underscore. (1 hr) Write a JavaScript function to check whether a given value represents a domain or not. Write a JavaScript function to check whether a given value is html or not. (1 hr)	
Bootstrap Framework	**Excercise duration - (30 hrs) x** Building responsive webpage using bootstrap (20 hrs) x Use jQuery selectors to identify elements with these properties in a hypothetical page: (2 hrs) ◦ All p tags that have no children, but only if they don't have a class of ignore ◦ Any element with the text "REPLACE_ME" in it. ◦ All div tags with a child that has a class of special ◦ All heading elements (h1, h2, h3, h4, h5, h6) ◦ Every other visible li. x Write jQuery Code to change the hyperlink and the text of a existing link. (30 mins) x How to Print a Page Using JQuery? (30 mins) x Display and hide message shown in the div tag on click of the buttons. (30 mins) x Create one button and a textbox. On click of the button the text written in text box should display on the button. (1 hr) x Toggle a specified class when an element is clicked. (30 mins) x Disable the submit button until the visitor has clicked a check box. (30 mins) x Create a text input field. Listen for the keyup event. Alert the value of the text box whenever keyup occurs. (1 hrs) x Set a timer to delay execution of subsequent items in the queue. (30 mins) x Find all the text nodes inside a paragraph and wrap them with an italic tag. (1 hr) x Write a jquery to attach a change event to the select element (Use to create a drop-down list.) that gets the text for each selected option and writes them in a paragraph.(1 hr) x Find the widths and heights of various elements. Get the scroll top and left of an element.Access the position of an element. (1 hr)	**Overview of Bootstrap- (20 hrs)** Introduction of Bootstrap, Syntax of Bootstrap, Advantages of bootstrap, Container and Container-fluid, Connectivity of Bootstrap in page **Bootstrap Component-** Jumbotron, Button, Grid, Table, Form, Alert, Badge and label, Panels, Pagination, Image, Glyphicon, Carousel, Progress Bar, List Group, Dropdown, Collapse **Bootstrap Advance Component -** Tabs/Pill, Navbar, Input Types, Modals, Popover, Scrollspy **Bootstrap Utilities -** Bootstrap Border, Bootstrap Clearfix, Bootstrap Close Icons, Bootstrap Colors, Display Flexbox, Display Property, Image Replacement, Invisible Content, Bootstrap Position, Responsive helpers, flexbox, Bootstrap sizing, Bootstrap spacing, Bootstrap Typography Introduction to JQuery JQuery Basics JQuery Selectors jQuery – DOM Attributes jQuery – DOM Traversing jQuery – CSS Methods jQuery – Effects

DBMS	**Excercise duration - (10 hrs)** Installing SQL (1 hrs) 1. Creating and Manipulating Database objects and Applying 2. Constraints (DDL) (2 hrs) 3. Manipulating Data with Database Objects (DML) (1 hrs) 4. SQL Single Row Functions (1 hrs) 5. Displaying Data from Multiple Tables (Join) (2 hrs) 6. SQL Multiple Row Functions (Aggregate Function) (1 hrs) 7. SQL using sub query (2 hrs)	**Basic Concepts of DBMS (20 Hrs.)** x Purpose of database systems – Data abstraction – Database Users – Data Independence (Logical & Physical) – Instance & Schemes –Three layered Architecture of DBMS – Different Levels of Abstraction. x DATA MODELLING, E-R MODELLING x LOGICAL MODELS: Object & Record based – Object oriented model – Entity relationship 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. x RELATIONAL DATABASE MANAGEMENT, RELATIONAL ALGEBRA & RELATIONAL CALCULUS 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.
Software Development Life Cycle		**Overview 5 hrs)** x What is SDLC? x Phases of Software Development Life Cycle (SDLC), x Software Development Life Cycle Models x Software Test Levels

Syllabus for Diploma in "IT, Networking and Cloud"		
Module 3 - Backend Web Technologies & Frameworks (320 hrs)		
Learning outcome	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**

Able to understand Mongo DB	**DBMS with MongoDB (80 Hrs.)**
	• Install using XAMPP software package for MySQL, PHP and other utilities
	• Connect to MySQL database system and create new database
	• Create tables in new database and enter sample data
	• Import data into database table from CSV file
	• Read data from database table, all data, filtered data based on SQL queries
	• Update single record, and multiple records based on criteria
	• Delete selected records from table
	• Work with SQL stored procedures
	• Perform transaction in database tables using commit and rollback operations
	• Demonstrate use of transaction control in relational databases
	• Perform user management activities in MySQL database, create, modify user, set privileges
	• 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 display all the documents in the collection data (Trainees data) 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 todisplay 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
		Basic Concepts of MySQL and MongoDB (40 Hrs.)
		• Understanding MySQL database
		• MySQL syntax and semantics
		• MySQL DDL
		• MySQL DML
		• MySQL Transaction Control
		• MySQL User Management
		• MySQL Security aspects
		• MySQL Query execution
		• MySQL query optimization
		• MySQL Complex queries
		• Unstructured databases
		• Structured vs unstructured data
		• MongoDB fundamentals
		• MongoDB documents, databases, reords
		• MongoDB Atlas cluster
		• MongoDB Atlas cluster connection and access remotely
		• MongoDB Queries, filters, criteria
		• Managing multimedia data in databases
		• Fundamentals of Big data
		• Managing Big Data
		• Big data tools and technologies
		• Big data in cloud
		• Big data analytics

	• Create a MongoDB query to find lab wise details of trainees • Create a MongoDB query with course wise details of trainees • Create MongoDB cluster in MongoDB Atlas cloud service • Connect and use MongoDB Atlas on local system • Get familiar with big data and its tools	

Able to learn concept of PHP	**PHP (Hyper Text pre processor) (50 hrs.)** **Handling Html Form With PHP** • Capturing Form Data Dealing with Multi-value filed Generating File uploaded form • 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 functionto check a number is prime or not • Write a function to reverse a string • 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	**PHP(Hyper Text pre processor) (30 Hrs.)** • Decisions and loop - Making Decisions, Doing Repetitive task with looping, Mixing Decisions and looping with Html • 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 Graphics Creating Image Manipulating Image Using text in Image • 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.

	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 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 • Create and retrieve a cookie • Modify a cookie value (2Hrs) • 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)	• Object Oriented Programming and PHP 5 • Debugging PHP Code • PHP Session Handling Features • Handling Date & Time in PHP
Concept of Laravel	**Skills on Laravel Framework (80 hr)** • Installation of the Laravel in the System • First Program by edit the View as Hello World • Create a Web application of minimum 4 blades demonstrating the blade template in laravel • Create a web Application which demonstrate routing through controller • Create a Form which inserts the data in the database • Demonstrate all the CRUD operation using (DB) from controllers • Create a Model and Demonstrate all CRUD operations • Creating a complete end-to –end solution which demonstrate session and database connectivity • Demostrate csv file upload in laravel , extract its data and insert into database • Installation and usage of jet brains Live wire and its component • Create a login and register Forms using Live wire	**Laravel Framework (40 Hr)** • Introduction to MVC Architecture • What is framework and its Benefits • Laravel and its architecture • Blade templating engine in laravel • Views in laravel with complete conditional and looping construct. • Controllers and its usage. • Complete database connectivity with DB • Complete Database connectivity with Eloquent • Model and its working. • Migrations in Laravel • Database seed in laravel • Handling Session in Controllers and Views • .env File and its usage • Introduction to Jet brains(Live Wire)

Syllabus for Diploma in "IT, Networking and Cloud"			
Core Module 4: Python Programming and Web Development using Django: 320 Hrs			
HOUR No.	**Learning outcome Reference**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		(With indicative Hours)	
	Able to work in Python programming	**Skills based on core python programming (80 Hrs)** • Install Python software in the system and set paths • Print a string using print statement • Print given string using indentation (space between characters) • Define Integer Variables, floating variables and string variables and find its type and memory addresses • 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 • 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 and perform all operations • Write a Python program to create a tuple with different data types	**Python Programming: 60 Hrs** • Python, History, Features, Setting up path • Basic Syntax, Variable and Data Types Operators • Conditional Statements, Looping, Control Statements • String Manipulation, Lists, Tuple, dictionary, sets • Functions and Methods, modules • File IO, Exception handling • Object Oriented programming using Python • Python for Web: Flaks and django

		• Write a Python program to create a dictionary and perform functional operations • Write a Python program to find maximum and the minimum value in a set. • Write program to copy contents of text file to another new file • Write program to copy content of image/video file to another • Write program to demonstrate exception handling while creating file, reading file, writing file and deleting a file • Write a program to demonstrate file handling in connecting to database and performing operations • Create student database in mysql and connect using python • Perform CRUD operations on mysql database using python • Perform CRUD operations on MongoDB database using python • Create a student class with related data elements and methods. Write functionalities for basic operations of student in a college • With student class already created, perform database crud operations including validation of data while writing to DB and when reading from DB • Create a simple python Flask app with at least 3 basic routes	

	Able to create django application	**Skills related to working with django framework (120 hr)** • Install django framework libraries in python and test for installation • Setup first django application • Creating django application with MVT architecture • Create django application that handles file uploading • Create django application that reads data from CSV and display on page • Create django application that reads data from JSON and display on page • Creating django application which implement CRUD operations over database • Create django application validates user credentials on login page • Create admin panel using django, using AJAX • Perform crud operations in django app using AJAX at single page • Create django application which sends email to any recipient	**Python for Web- django: 60 hrs** • Web Framework, Django Introduction, Django Architecture • Django MVC, MVT (Model View Template) • Views and URL mapping, HttpRequest and HttpResponse, GET and POST Method • Template, Render, Views, Context • Template Editing • SQL operation in django • Handling sessions, cookies and working with JSON and AJAX

Core Module 5: Business Data Analytics methods and tools: (320 Hrs)			
HOUR No.	Learning outcome Reference	Professional Skills (Trade Practical)	Professional Knowledge (Trade Theory)
		With Indicative Hours	
	Able to understand business analytics and develop business intelligence	**Introduction to Business Analytics Overview (60 Hrs.)** • Use Excel for understanding different types of data (Integer, double, text, date) • Perform operations on different data types. • Segregate data in different sheets. • Calculate arithmetic mean, geometric mean and Harmonic mean • Calculate median from raw & grouped data • Calculate mode for row & grouped data • Calculate standard deviation for set of data • Calculate standard variance for a set of data • Using VLOOKUP in excel for searching operation • Plot basic charts in excel over numeric data series • Plot uniform and binomial distributions in excel • Implement Central limit theorem in excel • Generate data table and find chi-square analysis	**Business Analytics (50 Hrs.)** • Introduction to business analytics and concepts of business analytics. • Trends in business analytics. • Introduction to Big Data Analytics • Introduction to descriptive statistics and inferential statistics, measure of central tendency and spread. • Types of distributions-uniform, binomial, normal, log, exp • Sampling techniques, population • Probability theories • Bayes' Theorem, Maximum Likelihood • Hypothesis Testing • Central limit theorem • Chi-square test
	Able to analyze data using statistical and data mining techniques for business intelligence.	**Business Analytics Foundation (60 Hrs.)** • Install NumPy, pandas, matplotlib, Seaborn, sklearn in python 3 • Creating arrays in NumPy • Creating multidimensional array in NumPy • Numpy Operations, methods and attributes • Numpy case studies • Understanding Pandas series and dataframe • Pandas ingestion of data from csv, json, html, excel, text files • Pandas functionalities for Series & Data Frames • Grouping, Merging, concatenating, joining, segregation • Python lambda function operations on series or data frames • Dealing with missing and noisy data • Finding outliers • Visualising your data through matplotlib under basic charts • Labels, legends and axes • Subplotting, grid, and 3D plots	**Data Analytics using Python (30 hr)** • Data mining, wrangling, data manipulation techniques • Data cleaning and pre-processing techniques • Data analytics project lifecycle • Numerical Computing using NumPy Library • Multidimensional data handling using Pandas Library • Data Visualization using Matplotlib • Advanced data visualization using seaborn • Pandas profiling for report generation • Need for data visualization

		• Plot formatting- custom attribute values • Advanced charts in seaborn- countplot(), jointplot(), boxplot(), heatmap(), regression plot, etc	
	Able to use machine learning techniques to generate predictive analytics model	**Skills on predictive analytics using ML (80 hr)** • Installing sklearn library • Simple linear regression using excel • OLS in sklearn • Train-test-split of data in sklearn • Methods of linear regression- fit(), predict(), coeff_, intercept_, score() • Creating linear regression model in python • Evaluating linear regression model • Performing minmax scaling and standard scaling • Implementing KNN in python using sklearn • Evaluation of KNN model in python, and visualizing results • Evaluating model using AUC, ROC curve • Implementing logistic regression for binary and multi-class classification • Sigmoid function in Logistic regressions • Predicting probability of classification models • Charting confusion matrix • Integration of analytics with django/Flask app	**Fundamentals of Predictive Analytics using Machine Learning techniques (40 hr)** • Machine learning and its types & applications • Supervised machine learning techniques • Classification vs regression • Understanding Regression and types • Linear regression using OLS • Multi-Variate Linear Regression • Correlation concepts • Metrics- Loss function, MSE, RMSE, MAE, R2 Score • Residuals in Regression • Polynomial features • Classification techniques • Types of distance metrics • KNN Classification • Gradient Decent • Logistic Regression • Evaluation- Confusion Matrix, Precision, Recall, F1 Score, Accuracy • Python Library: Sci-Kit Learn
	Project work / Industrial Visit		
	Revision		
	Examination		

Syllabus for Diploma in "IT, Networking and Cloud"			
Elective Subject 1: Cloud Application Developer: 320 Hrs.			
Hour No.	**Learning outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		(With indicative Hours)	
1-200	Able to understand the Cloud, Architecture, App Development & Deployment in cloud environment.	Following operations will be performed on the Cloud platforms: Skills on fundamentals of cloud (20 Hrs) • Create cloud account on IBM cloud and AWS, creating custom dashboard • Operations like creation, launch, security, and cleaning of instances will be performed on AWS cloud EC2 service • Creating S3 bucket and manage file life cycle • Host static website on S3 service Skills on Essentials of Cloud Application Development on IBM Cloud (20 Hrs) • Creating web application with IBM Cloud Foundry sample apps using web console • Connecting IBM Cloud using CLI, creating organisation, space, defining CF parameters • Creating application from CLI • Downloading sample code and re-deploying using CLI • Connecting IBM Cloud Cloudant with sample web application via CLI • Managing app and deleting applications from CF	(**75 Hrs of Theory)** • Introduction to cloud, benefits, types, service delivery models • Understanding AWS cloud global infrastructure, scalability, elasticity, fault tolerance, reliability & durability aspects. • Introduction to core services- compute, storage, network, database, security & management • Getting started with IBM Cloud foundry, benefits, features, use cases, get introduced to Storage, PaaS Model services in IBM Cloud, Hosting web application son PaaS • Understanding web application deployment strategies and planning. Preparing application for cloud deployment over PaaS model instance in IBM Cloud Foundry • IBM Cloud CLI • Cloud Best practices
		Skills on Essentials of Cloud Application Deployment on IBM Cloud Foundry- PaaS Model (60 Hrs) • Preparing PHP web application to get deployed on cloud PaaS • Deploying PHP app on IBM Cloud Foundry • Updating application on local environment and re-deploy to Cloud Foundry • Preparing Django web application to get deployed on cloud PaaS • Deploying Django app on IBM Cloud Foundry • Updating application on local environment and re-deploy to Cloud Foundry • Preparing NodeJS web application to get deployed on cloud PaaS • Deploying NodeJS app on IBM Cloud Foundry • Updating application on local environment and re-deploy to Cloud Foundry Skills on deploying application on AWS (25 Hours) • Deploy PHP application on AWS Elastic Beanstalk service	

		• Deploy Django application on AWS Elastic Beanstalk service • Deploy NodeJS application on AWS Elastic Beanstalk service	
201-320	Able to develop Cloud applications.	Projects: (120 Hrs) Develop an application and deploy on cloud: (Examples) 1. Health Vitals Calculator- BMI, BMR, Obesity level 2. Vaccination Registration	
	Revision		
	Examination		

Syllabus for Diploma in "IT, Networking and Cloud"			
Elective Subject 2 : Cloud Enterprise Developer : 320 Hrs.			
Hour No.	**Learning outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		(With indicative Hours)	
1-200	Able to Build a web application on modern cloud-based architectures and services	**Skills on Managing application with serverless compute, DevOps and API management Services (50 Hrs)** • Analyze your web app on migration tools and develop strategy of migration • Create DevOps toolchain for cloud foundry application and enable CI/CD • Create Serverless functionality using AWS Lambda • Create multiple connected functions on AWS Lambda • Create serverless functionality using IBM Cloud Function • Create multiple connected functions on IBM Cloud Functions **Skills on creating RESTful APIs and working with them (50 hours)** • Create API on IBM Cloud using API management service with Cloud Function operations • Extend API with multiple related functionalities. • Connect web app hosted in cloud with API service and make functionalities available over different routes to web app • Create containerized application over AWS ECS service using docker images • Scale container application using Kubernetes AWS EKS service **Skills on hybrid application design and deployment (25 hours)** • Create hybrid web application (cloud to cloud) using MongoDB Atlas database and web application hosted in IBM Cloud Foundry (PaaS) • Create an on-premises server run hybrid application connected to database hosted in cloud	**(75 Hrs of Theory)** • Migrating application to Cloud-planning, strategy, requirements, migration techniques • Understanding DevOps, tools, DevOps services in Cloud • AWS Code Commit, Deploy and Pipeline • IBM Cloud DevOps Toolchain & Services • Understanding REST API, API services in IBM and AWS Cloud. • Serverless architecture and related services • Container applications, docker, Kubernetes, services in cloud supporting container applications • Hybrid Application scenarios, architectures and best practices
201-320	Able to deploy cloud application on hybrid architectures	Projects: (120 Hrs) Create a small data analytics dashboard application and host in cloud environment. (Suggested: Heroku App Cloud Environment)	
	Revision		
	Examination		

Syllabus for Diploma in "IT, Networking and Cloud"			
Elective Subject 3: Web Development using JS Frameworks : 320 Hrs.			
Hour No.	**Learning outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
		• **(with indicative Hours)**	
1-200	Able to develop the real time scenarios based on Node JS applications.	• Install Angular JS • Create an Angular application which add, multiply, divide the two input numbers from textbox • Create an Angular application which can validate the email accepted from user • Create an Angular application with form validation • Create an Angular application which can create Captcha • Create Responsive Web Application using Angular • Create an Angular application using Node JS with complete templating system • Create a basic JS Program with Node • Create Module (Function) & export, import using Node • Create a Web Application using Express JS • Create restapi using express JS • Create Restapi & testing rest api postman • Create application with CRUD operations using Mongo DB • Web Application Integration Using Express+Angular+Mongo	• Introduction to mean stack • Introduction to Angular JS and UI benefits in Angular JS • Usage of Angular JS with HTML • Event Handling in Angular JS • Introduction to Angular & difference b/w angular-1 to angular-5 • Type Script Datatype & Operator • Type Script String & Tuple, Oops • Object & Class • Inheritance & Interface • Angular js Child Component • Angular js Data Binding, Event Binding,2 Way Binding • Angular js Pipe, Pipe Chaining • Angular js Routing • Angular js Services • Angular js Http Request • Node Introduction • Blocking & Nonblocking code • Create Module & export, import • Introduction package.json file • File Handling • Create Event Driven Programming • Socket Programming • Create Own web server • Create Web App using express • Introduction Middleware Concepts • Express Routing • Express JS Template Engine • Handling Query string parameter • Cookies parser & body parser, • Session Handling (express session), Mailer

			• database operation with MySQL • Introduction Mongo • Features of Mongo • Create database, collection, Document & Data • Simple Query, Insert select data, filter data • Capped collection, Update & delete Collection • Index and Relationship, Aggregation & grouping, JOIN • Import & export mongo database, Backup restore • database operation with Node +Mongodb
	Able to develop Website using Mean Stack and deploy in cloud	**Projects: (120 Hrs)** Create a simple HRM System web application for employees registration and login	
	Revision		
	Examination		