Curriculum for

Certificate Programme in

COMPUTER MAINTENANCE AND PROGRAMMING ASSISTANT

For
Maharaja Ranjit Singh Punjab Technical University,
Bathinda (Punjab)

Prepared By:

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FOREWORD

Rapid industrialization and globalization has created an environment for free flow of information and technology through fast and efficient means. This has led to shrinking of the world, bringing people from different culture and environment together and giving rise to the concept of world turning into a global village. In order to cope with the challenges of handling new materials, machines and technologies, we have to develop human resources having appropriate competencies. There is an increasing demand of skilled workforce in India in particular and the world over in general. Under the new circumstances, India faces a challenging task of meeting the technical manpower requirement, especially in the area of skilled workforce to cater to industrial needs. Efforts have to be made so that passouts from our technical institutions are acceptable at global level.

Technical education system is one of the significant components of the human resource development and has grown phenomenally during all these years. Technical institutions play an important role in meeting the requirements of trained technical manpower for industries and field organizations. The initiatives being taken by Maharaja Ranjit Singh Punjab Technical University (MRSPTU), Bathinda, Punjab to start the skill oriented integrated courses at certificate, diploma and degree level, as per the needs of the industry, are laudable.

In order to meet the future requirements of technical manpower, we will have to revamp our existing technical education system and one of the most important requirements is to develop outcome-based curricula of technical programmes at various levels. The curricula for various programmes have been revised by adopting time-tested and nationally acclaimed scientific method, laying emphasis on the identification of learning outcomes of programme and various courses.

The success of any technical programme depends upon its effective implementation. However best the curriculum document is designed, if it is not implemented properly, the output will not be as per expectations. In addition to acquisition of appropriate physical resources, availability of motivated, competent and qualified faculty is equally essential for effective implementation of the curricula.

It is expected that MRSPTU will carry out curriculum evaluation on a continuous basis to identify the new skill requirements. At the same time, it is expected that innovative methods of course offering will be used to develop desired skills and infuse the much needed dynamism in the system.

Dr. M.P. Poonia
Director
National Institute of
Technical Teachers Training & Research
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PREFACE

Curriculum document is a comprehensive plan of an educational programme. It is through the curriculum that the educational objectives of a programme are achieved. It has to be ensured that the curriculum is dynamic, articulated, balanced, data based, feasible, and as per industrial needs. Curriculum Development Centre at NITTTR, Chandigarh has been extending services to technical education system of the states in northern region in developing and updating their curriculum on regular basis.

Maharaja Ranjit Singh Punjab Technical University (MRSPTU), Bathinda, Punjab assigned the project for developing the curriculum of some integrated programmes to this institute in the month of May 2016. A series of curriculum workshops were held during the months of June-July, 2016. This curriculum document is an outcome of the extensive discussions held with the representatives from various organizations, technical institutions and industry during the curriculum workshops. While developing the study and evaluation scheme and detailed contents, the following aspects have been kept in mind:

- Employment Opportunities of Certificate holders
- Job role of certificate holders
- Learning outcome of the Programme
- Mobility of students for their professional growth

We have taken cognizance of recommendation of experts both from industry and academic institutions and have adequately incorporated segments of Industrial Training in the curriculum. Time has specifically been allocated for undertaking extra-curricular activities. Emphasis has been laid on developing and improving communication skills in the students for which units on Communication Skills have been introduced in both the semesters of the certificate course.

We hope that this curriculum document will prove useful in producing skilled manpower at desired level in the state of Punjab. The success of this outcome-based curriculum depends upon its effective implementation and it is expected that MRSPTU will make all efforts to create better facilities, develop linkages with the world-of-work and foster conducive and requisite learning environment as prescribed in the curriculum document.

Professor and Head
Curriculum Development Centre
NITTTR, Chandigarh

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Coordinator

SALIENT FEATURES OF THE PROGRAMME

1.	Sector	:	IT-ITES
2.	Name of the Certificate Programme	:	Computer Maintenance and Programming Assistant
3.	Entry Qualification	:	Matriculation or equivalent NSQF Level as prescribed by MRSPTU, Bathinda
4.	Duration of the Programme	:	One Year
5.	Intake	:	30
6.	Pattern of the Programme	:	Semester Pattern
7.	NSQF Level	:	Level - III
8.	Ratio between theory and Practice	:	20 : 80 (Approx.)

2. JOB ROLE AND JOB OPPORTUNITIES

The role of a **Computer Maintenance and Programming Assistance** to support and maintain computer systems, desktops, and peripherals. This includes installing, diagnosing, repairing, maintaining, and upgrading all hardware and equipment while ensuring optimal workstation performance. The person will also troubleshoot problem areas in a timely and accurate fashion, and provide end user training and assistance where required. He will also proved support and maintain computer network systems and its peripherals. This includes installing, diagnosing, repairing, maintaining, and upgrading computers and basic network hardware and equipment while ensuring optimal network performance. The person will also troubleshoot problem areas in a timely and accurate fashion, and provide end user training and assistance where required. Install, maintain and setup LAN with Internet Connection and protection/security. After completion of the course the trainees shall be qualified for one or more of the following job roles:

Job Roles

- Installing, maintaining and repairing software or hardware
- Troubleshooting different computer issues
- Determining and installing appropriate protection/security measures
- Install, configure, and maintain common end user application software. May train and provide assistance to end users.
- Installing, maintaining and repairing network hardware
- Troubleshooting different computer network issues
- Installing and Configuring basic computer networks
- Providing technical support on-site or via phone or email
- Troubleshoots software and hardware problems related to Internet applications.
- Install, maintain and setup network with computers, printers and other peripheral equipment as well as configure broadband equipment.

Job Opportunities

On successful completion of this course, students should be able to find gainful job opportunities in the divisions of different industries like those listed below besides exploring possibilities of being an entrepreneur and be self-employed. The list given below is only indicative and not comprehensive.

(a) Wage Employment

- Service Division (IT enabled services, maintenance service and installation of computer services)
- Assembly and Quality Control Division
- Web Development Industries

- Publishing Industry
- Animation Industry
- Data Processing Industry
- Telecommunication Sector
- Teaching Organizations (Polytechnics, Vocational Institutions etc)
- Networking(LAN, WAN etc)
- Defence Services/Police Services/Cyber Services/Forensic Services
- Call Centres, BPO etc.

(b) Self Employment

- Small scale unit doing third party service and maintenance of computer systems and networks
- Small scale vendor of computer cards, computer peripherals and electronic components and devices
- Setting up of computer assembly unit (small scale)
- Web Designing/Publishing/Software Development Entrepreneurship
- Internet Kiosk Operator
- Cyber Cafe setup and management etc.

3. LEARNING OUTCOMES OF THE PROGRAMME

After undergoing the programme, the students will be able to:

- Operate computer system and various peripherals, search engines and email.
- Assemble, install and configure network elements
- Install Window Operating System and software
- Use all the applications of MS Office
- Create web pages using HTML and CSS
- Create and manage databases and tables
- Design and develop a website
- Make audio-video images and movies using multimedia and creative designs
- Use different content management systems and create websites and blogging pages
- Work in industrial environment on any project.

4. STUDY AND EVALUATION SCHEME FOR CERTIFICATE PROGRAMME IN COMPUTER MAINTENANCE AND PROGRAMMING ASSISTANT

FIRST SEMESTER

CODE	UNITS	STUDY SCHEME Total Hours		CREDITS	MARKS IN EVALUATION SCHEME								Total Marks
					INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		Th	Pr		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
CCSE1-101	*Communication Skills	8	-	1	25	-	25	25	1	-	-	25	50
CCSE1-101P	*Communication Skills Lab.	-	24	1	-	50	50	-	-	75	3	75	125
CCSE1-102	Computer Fundamentals	16	-	1	25	-	25	25	1	-	-	25	50
CCSE1-102P	Computer Fundamentals Lab.	-	48	2	-	50	50	-	-	75	3	75	125
CCSE1-103	PC Assembling, Dissembling and Networking	16	-	1	25	-	25	25	1	-	-	25	50
CCSE1-103P	PC Assembling, Dissembling and Networking Lab.	-	112	4	-	75	75	-	-	75	3	75	150
CCSE1-104	Installation and Working of Operating Systems	16	-	1	25	-	25	25	1	-	-	25	50
CCSE1-104P	Installation and Working of Operating Systems Lab.	-	80	3	-	50	50	-	-	100	3	100	150
CCSE1-105	Office Automation	16	-	1	25	-	25	25	1	-	-	25	50
CCSE1-105P	Office Automation Lab.	-	80	3	-	50	50	-	-	100	3	100	150
CCSE1-106	Fundamentals of Internet and Webpage Development	16	-	1	25	-	25	25	1	-	-	25	50
CCSE1-106P	Fundamentals of Internet and Webpage Development Lab.	-	80	3	-	50	50	-	-	100	3	100	150
CCSE1-107P	#Student Centred Activities (SCA)	-	48	2	-	25	25	-	-	-	-	-	25
CCSE1-108P	$^{+}$4 Weeks Industrial Training (during vacation)	-	-	4	-	-	-	-	-	100	3	100	100
Total		**88**	**472**	**28**	**150**	**350**	**500**	**150**	**-**	**625**	**-**	**775**	**1275**

* Common with other certificate programmes

\# SCA will comprise of co-curricular activities like extension lectures on entrepreneurship, environment and energy conservation, sports, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities etc.

+ **Industrial Training**

After examination of 1st Semester, the students will go for training during vacation in a relevant industry/field organization for a minimum period of 4 weeks and will prepare a diary. The students will prepare a report at the end of training and will present it in a seminar. This evaluation will be done by concerned instructor in the presence of one industrial representative from the related programme/trade.

Total weeks per Semester = 16 Total working days per week = 5 Total hours per day = 7

Total hours in a Semester = 16 x 5 x 7 = 560

One credit is defined as one hour of lecture per week or two hours of practicals per week for one semester. Fractions in credits have been rounded to nearest integer.

SECOND SEMESTER

CODE	UNITS	STUDY SCHEME Total Hours		CREDITS	MARKS IN EVALUATION SCHEME								Total Marks
					INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
		Th	Pr		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
CCSE1-209	*Basic Sciences	48	-	3	25	-	25	50	2	-	-	50	75
CCSE1-210	Relational Data Base Management System	16	-	1	25	-	25	25	1	-	-	25	50
CCSE1-210P	Relational Data Base Management System Lab.	-	80	3	-	50	50	-	-	100	3	100	150
CCSE1-211	Programming Concepts Using PHP and MySQL	32	-	2	25	-	25	50	2	-	-	50	75
CCSE1-211P	Programming Concepts Using PHP and MySQL Lab.	-	96	3	-	50	50	-	-	100	3	100	150
CCSE1-212	Multimedia and Creative Design	16	-	1	25	-	25	25	1	-	-	25	50
CCSE1-212P	Multimedia and Creative Design Lab.	-	80	3	-	50	50	-	-	100	3	100	150
CCSE1-213	Content Management System	16	-	1	25	-	25	25	1	-	-	25	50
CCSE1-213P	Content Management System Lab.	-	64	2	-	50	50	-	-	75	3	75	125
CCSE1-214P	Project Work	-	64	2	-	50	50	-	-	75	2	75	125
CCSE1-215P	#Student Centred Activities (SCA)	-	48	2	-	25	25	-	-	-	-	-	25
CCSE1-216P	$^{+}$4 Weeks Industrial Training	-	-	4	-	-	-	-	-	100	3	100	100
Total		**128**	**432**	**27**	**125**	**275**	**400**	**175**	**-**	**550**	**-**	**725**	**1125**

* Common with other certificate programmes

\# SCA will comprise of co-curricular activities like extension lectures on entrepreneurship, environment and energy conservation, sports, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities etc.

$^{+}$ **Industrial Training**

After examination of 2nd Semester, the students will go for training during vacation in a relevant industry/field organization for a minimum period of 4 weeks and will prepare a diary. The students will prepare a report at the end of training and will present

it in a seminar. This evaluation will be done by concerned instructor in the presence of one industrial representative from the related programme/trade.

5. GUIDELINES FOR ASSESSMENT OF STUDENT CENTRED ACTIVITIES (SCA)

It was discussed and decided that the maximum marks for SCA should be 25 as it involves a lot of subjectivity in the evaluation. The marks may be distributed as follows:

i. 5 Marks for general behavior and discipline
(by Principal in consultation with all the trainers)

ii. 5 Marks for attendance as per following:
(by the trainers of the department)

a)	75%	Nil
b)	75 - 80%	2 Marks
c)	80 - 85%	3 Marks
d)	Above 85%	5 Marks

iii. 15 Marks maximum for Sports/NCC/Cultural/Co-curricular/ NSS activities as per following:
(by In-charge Sports/NCC/Cultural/Co-curricular/NSS)

a)	15	-	National Level participation or inter-University competition
b)	10	-	Participation in two of above activities
c)	5	-	Participation in internal sports of the University

Note: There should be no marks for attendance in the internal sessional of different subjects.

UNIT – 1.1
SUBJECT CODE: CCSE1-101
COMMUNICATION SKILLS

LEARNING OUTCOMES:

After undergoing this unit, the students will be able to:

- Speak confidently.
- Overcome communication barriers.
- Write legibly and effectively.
- Listen in proper prospective.
- Read various genres adopting different reading techniques.
- Respond to telephone calls effectively.

Practical (24 Hours)	**Theory (08 Hours)**
	Basics of Communication • Process of communication • Types of communication - formal and informal, oral and written, verbal and non-verbal • Objectives of communication • Essentials of communication • Barriers to communication (1 hour)
• Looking up words in a dictionary (meaning and pronunciation) (2 hours)	Functional Grammar and Vocabulary • Parts of speech • Tenses • Correction of incorrect sentences (2 hours)
• Self and peer introduction • Greetings for different occasions (1 hour)	Listening • Meaning and process of listening • Importance of listening • Methods to improve listening skills Speaking • Importance • Methods to improve speaking • Manners and etiquettes (2 hours)
• Newspaper reading (1 hour)	Reading • Meaning • Techniques of reading: skimming, scanning, intensive and extensive reading (1 hour)
• Vocabulary enrichment and grammar exercises • Exercises on sentence framing accurately (6 hours)	Functional Vocabulary - One-word substitution - Commonly used words which are often misspelt - Punctuation - Idioms and phrases

(2 hours)	
• Reading aloud articles and essays on current and social issues • Comprehension of short paragraph (5 hours)	
• Write a short technical report • Letter writing (3 hours)	
• Participate in oral discussion • Respond to telephonic calls effectively • Mock interview (6 hours)	

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Laboratory and practical work
- Viva-voce

UNIT – 1.2
SUBJECT CODE: CCSE1-102
COMPUTER FUNDAMENTALS

LEARNING OUTCOMES:

After undergoing this unit, the students will be able to:

- Operate computer system and various peripherals.
- Work on Windows control panel.
- Work on search engines
- Communicate through emails, send and receive files through emails.

Practical (48 Hours)	**Theory (16 Hours)**
• Identify various peripherals of a computer system such as Printers, keyboard, mouse, scanners, MODEM, speakers, microphone, projectors, monitors and other display devices. • identify various cables and connectors used. • Draw and explain block diagram of a computer system with peripherals. (10 hours)	• Introduction to various input & output devices. (3 hours)
• Identifying Motherboard, various cards, memory slots, microprocessor and other important chips. (5 hours)	• Define hardware and software. Define memory and its types: primary & secondary memory. Measurements of memory: bit, byte, MB, GB, TB,etc) • Introduction to RAM and ROM. (5 hours)
• Identify various ports, HDD, CD drive, DVD drives and their connectors. (3 hours)	• Differentiate between HDD, CD, DVD and other drives(ZIP) (2 hours)
• Start and shutdown a PC. • Use various icons and buttons. • Working with windows. (4 hours)	
• Making Files and folders in Windows. • Coping folders to auxiliary memory. • Setting up parental controls in Windows. (6 Hours)	
• Work on various options of control panel. (10 hours)	
• Identify various browser on internet • Create an email id. Receive and send mails with Attachments-Zip and Unzip files. (6 hours)	• Explain internet. Discuss various applications of internet. • Introduction of various browsers. (4 hours)

• Working on search engines. • Search relevant topics and making an assignment of the same. (4 hours)	• Introduction to search engines (2 hours)

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Laboratory and practical work
- Viva-voce

UNIT - 1.3
SUBJECT CODE: CCSE1-103
PC ASSEMBLING, DISSEMBLING AND NETWORKING

LEARNING OUTCOMES:
After undergoing this unit student shall be able to:

- Demonstrate the assembling and dissembling of a PC.
- Install and configure of network elements on a network.
- Setup basic steps to ensure network security.
- Protect the system from virus and removing virus.

PRACTICAL (112 Hours)	**THEORY (16 Hours)**
Assemble and Dissemble a PC (28 hrs) • Steps for assembling a PC and commonly used devices such as installing a SMPS in a cabinet, fixing a processor in a mother board, installing RAM in a motherboard, pinning a cooling fan in a mother board. Demonstrate all electrical and other safety precautions. • Fix a Hard drive and DVD and connect the data and power cables. • Connect the cables from the SMPS to motherboard, hard disc, drives etc. Establishing data connection to motherboard, hard disc, drives. • Dissemble a PC with proper safety precautions.	• Introduction to computers, classification, generations, applications. Basic blocks of a digital computer. b) Hand Tools Basics and Specifications. a) Types of cabinets, • Precautions to be taken while removing and reconnecting cables (2 hrs)
Components of the Computer Network, Crimping, punching and cabling (24 hrs) • Familiarization with various network devices, connectors and cables. • Make a layout of network. • Crimping practice with straight and cross CAT 6 cables. • Punching practice in IO Box and patch panel. • Practice on cabling in a lab with HUB/Switch and IO Boxes and patch panel. Fitting Switch Rack.	• Introduction to Computer Network - Advantages of Network, peer-to-peer and Client/server Network. • Network Topologies - Star, Ring, Bus, Tree, Mesh, Hybird. • Type of networks – Local area network (LAN), Metropolitan area Networks (MAN), Wide Area Networks (WAN) and Internet, Ethernet, Wi-Fi, Bluetooth, Mobile Networking, Wire and wireless Networking. • Difference between Intranet and Internet. • Communication media & connectors - unshielded twisted-pair (UTP), shielded twisted-pair (STP), filber optics and coaxial cable: RJ-11, RJ-45, understanding color coding of CAT6 cable 568A and 568B convention. • Introduction to data communication - analogue and digital signal (4 hrs)

Install and Configure a Network (20 hrs) • Install and Configure a Peer-to-Peer Network using Windows Software. • Making cables by crimping. • Connect computers using Bluetooth. • Connect computers using configuration of routers and switches. • Practice on Basic Programmable switch Configuration.	• Theory of different OSI Model - the functions of different layers in OSI model • Introduction to Network Components - Modems, Firewall, Hubs, Bridges, Routers, Gateways, Repeaters, Transceivers, Switches, Access point, etc - their functions, advantages and applications. (2 hrs)
IP Addressing and TCP/IP (12 hrs) • Practice on IP Addressing technique (IPV4/IPV6) subnetting and supernetting the network.	• Protocols, TCP/IP, FTP, Telnet etc. • Classes of IP Addressing • Introduction to setting IP Address (IPV4/IPV6) and Subnet Mask and Supernet Mask. (2 hrs)
Sharing Resource and Internet Connection (12 hrs) • Sharing Resource and Advance sharing settings. • Configuring Internet Connection on a PC using Broadband or Dongle. • Use Internet for setting E-mail accounts.	• Concept of Internet • Architecture of Internet • DNS server • Internet Access Techniques • ISPs example - Broadband/Dialup/Wifi (2 hrs)
Network Protection and troubleshooting (8 hrs) • Setting up basic Protection using public keys and MAC address filter. • Integrate wired with wireless network. • Power over Ethernet (PoE). • Troubleshooting wired and wireless network.	• Understanding the use of wired and wireless networks • Protecting a Network • Network performance study and enhancement • Use of wi-fi hot spot with Mobile and laptop. (2 hrs)
Network Security (8 hrs) • Practice on firewall technologies to secure the network perimeter. • Practice LAN security considerations and implement endpoint and layer 2 security features. • Wi-Fi configuration to implement security considerations.	• Modern Network Security Threats and the basic of securing a network. • Secure Administrative Access, security considerations. Cryptography. • Wi-Fi security considerations. (2 hrs)

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Laboratory and practical work
- Presentation
- Viva-voce
- Drawing
- Assembly and disassembly

UNIT - 1.4
SUBJECT CODE: CCSE1-104
INSTALLATION AND WORKING OF OPERATING SYSTEMS

LEARNING OUTCOMES:

After undergoing this unit student will be able to:

- Install Windows OS, drivers and other software.
- Manage disks, files and folders, User Accounts.
- Use and troubleshoot issues using Task Manager.
- Take backup and perform recovery of data.
- Use essential accessories

PRACTICAL (80 Hours)	**THEORY (16 Hours)**
• Access and change Setup of BIOS- identifying the different options in BIOS and their purpose, changing the Boot sequence (4 hrs) • Practice on Windows Installation - Install Windows 7/8 or latest version of OS, Mac, Linux and Unix. Installation of drivers to use various components and peripherals. (10 hrs) • Installation of various Application and System software (10 hrs) • Practice on installation of various software such as MS Office, Libre Office, Open Source and utilities, chat, voice and video etc.) (4 hrs) • Checking the proper installation of various softwares. (4 hrs) • Uninstalling the software (4 hrs) • Executing application programs. (4 hrs) • User Management: Add, remove, enable, disable, delete User Accounts) - Setting properties and access rights of different users. (4 hrs) • Use and apply various windows power options. Put the system in sleep or hibernate mode. (4 hrs) • Practice on Windows Help. (2 hrs) • Disk Management (Create, delete and	• Introduction to operating system. Functions and types of an operating system (2 hrs) • Disk operating system, Concept of GUI. (1 hr) • Use of Desktop, My computer, network neighbourhood / network places, Recycle bin, task bar, start menu, tool bar, and menus. (1 hr) • Properties of files and folders. (1 hr) • Executing application programs. (2 hrs) • Properties of connected devices. (2 hrs) • Applications under windows accessories. (2 hrs) • Windows Help. (1 hr) • Control panel, installed devices and properties, Utilities for recovering data from defective/bad hard disks. (2 hrs) • Introduction to removable storage devices, Bulk data storage devices- magnetic, optical, magneto optical drives, WORM drives. CD ROM drives, DVD ROM drive and CD WRITER and use different modes of writing on a CD and Latest trends in backup devices/media. (2 hrs)

format partitions)- Opening disk management tool, identifying primary and secondary partitions. Understanding purpose of various partitions. Accessing files in various format options. Accessing external disks and pen drives, Using Disk management tools- check disk, Disk cleanup, Disk Defragmentation. (10 hrs) • File Management (working with Files and Folders using File Explorer)- Identifying the type of file from extension. Changing properties of a file, Sharing of file. Exploring different options of Windows file explorer. Making file hidden and visible, Recognizing difference between system and user files. Scanning a file using anti-virus. Opening and copying a file from external device to system hard disk, Writing data on CD/DVD. Erasing files from CD/ DVD (10 hrs) • Task Management: use and troubleshoot issues with task manager) - Using various options of task manager. Data Backup and recovery. (2 hrs) • Using essential accessories-notepad, word pad, paint brush, calculators, calendar, character map, system tools, entertainment, Using Multimedia and windows media player and sounds. (4 hrs) • Data Backup and recovery. Creation of Recovery CD – Using the recovery CD, Booting the system in safe mode, booting the system from pen drive, CD Drive, external hard drive. (4 hrs)	

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Laboratory and practical work
- Presentation
- Viva-voce
- Software installation and operation

UNIT - 1.5
SUBJECT CODE: CCSE1-105
OFFICE AUTOMATION

LEARNING OUTCOMES:
After undergoing this unit student will be able to:

- Use word processing software to create and save document files.
- Apply basic formula on data using spreadsheet software.
- Create presentation and insert different multimedia objects in presentation file using presentation software.
- Create simple table to store data in MS Access software.

PRACTICAL **(80 Hours)**	**THEORY** **(16 Hours)**
Word Processing Software: MS Office/ Libre Office • Familiarization with the Word window components. • Create, save and Edit documents using Word. • Insert headers, footer, watermarks, Bookmarks, Hyperlinks and other objects. • Page setup and Printing Documents using word. • Insert bullets, numbering, border etc. • Inserting and formatting tables and other objects. • Use templates, autocorrect tools, macros and the mail merge tool. • Check spelling and synonyms and antonyms. • Work with Page layout, margin settings and printing documents. • Typing practice using open source typing tutor tools. Speed of typing is 20 w.p.m. • Practice of using shortcut keys. (20 hrs)	Word Processing • Introduction to the various applications in office. • Introduction to Word features, Office button, toolbars. • Creating, saving and formatting and printing documents using Word. (4 hrs)

Spread Sheet Application: MS Excel • Create, Save and Format Excel Spreadsheets. • Use Absolute, Relative and mixed referencing, linking sheets, Conditional formatting etc. • Use Excel functions and formulas of all major categories. • Use various data types in Excel, Sorting, filtering, goal seek and validating data. • Create and format charts. • Import and Export Excel Data. • Perform data analysis using "what if" tools. • Modify Excel Page setup, page break and printing. • Analysing data using charts, data tables, goal seek and scenarios. • Apply and use of Excel and Word in any project. (20 hrs)	Spread Sheet Application • Introduction to Excel features and Data Types. • Cell referencing. Use of functions of various categories, linking Sheets. • Introduction to various functions in all categories of Excel. • Concepts of Sorting, Filtering and Validating Data. • Introduction to Reporting. (4 hrs)
Working with presentations Using Libre Office/MS Power point • Create Slides, Inserting Objects and displaying slide shows in MS Power point/Open Office. • Use different slide layouts. • Animate Slide transitions and Objects. • Insert images, audio, video, chart, tables etc in slides. • Grouping and ungrouping of various objects. • Insert page number, bullets and header/footer etc. • Creating Slide Shows. • Create a simple presentation project using Libre Office. • Take printout in handout format. • Working with Libre Office for word processing and worksheet application. (20 hrs)	Working with presentations Using Libre Office/MS Power point • Introduction to Power Point and its advantages. • Introduction to the properties and editing of images. • Fine tuning the presentation and good presentation techniques. (4 hrs)

Application of MS ACCESS • Create database and design a simple table in Access. • Enforce Integrity Constraints and modify the properties of tables and fields. (20 hrs)	Application of MS ACCESS • Concepts of Data, Information and Databases. • Rules for designing good tables. Integrity rules and constraints in a table. (4 hrs)

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Laboratory and practical work
- Presentation
- Viva-voce

UNIT - 1.6

SUBJECT CODE: CCSE1-106

FUNDAMENTALS OF INTERNET AND WEB DEVELOPMENT

LEARNING OUTCOMES:

After undergoing this unit student will be able to:

- Browse web sites using popular browsers and access their history.
- Communicate with other on Internet using e-mail and social networking sites.
- Access various services provided on cloud by different service providers and will be able to upload and download files securely
- Create web pages by inserting different multimedia elements and hyperlinks using HTML and CSS.

PRACTICAL (80 Hours)	**THEORY (16 Hours)**
Internet Concepts (60 hrs) • Demonstrate use of various types of internet like Broadband, Wireless, 2G, 3G, 4G, LAN Wi-Fi. etc • Explore different types of browsers like Mozilla Firefox, Google Chrome, Safari and their various functionalities like viewing history and downloads, working cookies, allowing pop-up etc. • Accessing various search engine on web browsers and search content on it. • Demonstrate the use and significance of various types of Domain name space and protocol like SSL, HTTP, HTTPS by using any browser. • Use ftp protocol to transfer any file by using software like FileZilla etc. or use various types of other protocol like telnet, SMTP, POP etc. • Live communication practice using text, audio and video by using various tools like GTALK, SKYPE etc. • Create an ID in Social networking site like Facebook, Twitter etc. and explore it various functions. • Explore various free cloud services like Google drive and drop-box etc. by creating id on it. • Implement security aspects by using firewall. • Identify viruses in the systems and removing them by using anti-viruses. • Configure Outlook mail service in PC/Mobile phones etc. •	Internet Concepts (12 hrs) • Introduction of concept of world wide web (www), internet, web browsers, various types of servers and search engines. • Concepts of Domain name space. • Introduction to video chatting tools, VOIP and Social Networking concepts. • Concept of cloud storage and open source web server. • Introduction to Internet Security, various threats and attacks, • Introduction and salient features of cybercrime and copyright law.

Introduction to HTML (20 hrs) • Create Simple HTML page by using heading tag, body tag, title tag, paragraph tag etc. • Format HTML by using table tag and list tags etc. • Design and develop web page with forms and form controls like radio button, check box, field box, button and other controls. • Create web page using basic features of CSS. • Design and edit webpages by using WYSIWYG web design tool. • Insert image, audio, video, links and marquees text in a web page.	Introduction to HTML (4 hrs) • Concept and introduction of Static and Dynamic Web pages. • Introduction to HTML and various tags in HTML. • Introduction to HTML structure, tags, features and uses.

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Laboratory and practical work
- Viva-voce

SUBJECT CODE: CCSE1-108
INDUSTRIAL TRAINING – I (4 Weeks)

The purpose of industrial training is to:

- Develop understanding regarding the size and scale of operations and nature of industrial/field work in which students are going to play their role after completing the courses of study.
- Develop confidence amongst the students through firsthand experience to enable them to use and apply institute based knowledge and skills to perform field activities.
- Develop special skills and abilities like interpersonal skills, communication skills, attitudes and values.

It is needless to emphasize further the importance of Industrial Training of students during their one-year certificate programme. It is industrial training, which provides an opportunity to students to experience the environment and culture of world of work. It prepares students for their future role as skilled person in the world of work and enables them to integrate theory with practice.

An external assessment of 100 marks have been provided in the study and evaluation scheme of 1st Semester. Evaluation of professional industrial training report through viva-voce/presentation aims at assessing students understanding of materials, industrial process, practices in industry/field organization and their ability to engage in activities related to problem solving in industrial setup as well as understanding of application of knowledge and skills learnt in real life situations.

The instructor along with one industrial representative from the concerned trade will conduct performance assessment of students. The components of evaluation will include the following:

a) Punctuality and regularity 20%
b) Industrial training report 50%
c) Presentation and viva-voce 30%

UNIT – 2.1
SUBJECT CODE: CCSE1-209
BASIC SCIENCES

LEARNING OUTCOMES:
After undergoing this unit, the students will be able to:

- Apply the basic principles of maths in solving the basic problems of the trade.
- Apply the basic principles of physics in solving the basic problems of the trade.

Practical	Theory (48 Hours)
	Mathematics • Basic Algebra – algebraic formula. Simultaneous equation – quadratic equations (4 hours) • Simultaneous linear equation in two variables (3 hours) • Arithmetic and geometric progression, sum of n-terms, simple calculations. (3 hours) • Mensuration – Find the area of regular objects like triangle, rectangle, square and circle; volumes of cube, cuboid, sphere cylinder (6 hours) • Trigonometry - Concept of angle, measurement of angle in degrees, grades and radians and their conversions, T-Ratios of Allied angles (3 hrs) • Co-ordinate Geometry - Cartesian and polar coordinates, conversion from cartesian to polar coordinates (2 hrs) • Concept of Differentiation and Integration (3 hrs)

	Physics • FPS, CGS, SI units, dimensions and conversions (2 hours) • Force, speed, velocity and acceleration – Definition, units and simple problems (3 hours) • Stress and strain, modulus of elasticity (2 hours) • Heat and temperature, its units and specific heat of solids, liquids and gases (4 hours) • Electricity and its uses, basic electricity terms and their units, D.C. and A.C., positive and negative terminals, use of switches and fuses, conductors and insulators (5 hours) • Work, Power and Energy-Defination, units and simple problems (4 hours) • Concept of force, Inertia, Newton's First law of motion; momentum and Newton's second law of motion; Impulse; Newton's third law of motion. **(**2 hrs) • Friction and Lubrication (1 hour) • Law of conservation of energy (1 hour)

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Model/prototype making

UNIT - 2.2
SUBJECT CODE: CCSE1-210
RELATIONAL DATABASE MANAGEMENT SYSTEM

LEARNING OUTCOMES:

After undergoing this unit student will be able to:

- Create and manage Databases and Tables.
- Apply integrity constraints to tables.
- Access data from various tables by writing simple SQL queries.
- Write nested queries to fetch data from tables.

PRACTICAL (80 Hours)	**THEORY (16 Hours)**
Database Fundamental (46 hrs) • Installing a RDBMS • Install My SQL. • Create Database through GUI • Create tables and assigning primary key • Inserting Data into table • Retrieving Data from table • Applying integrity Constraints in tables	Database Fundamental (8 hrs) • Introduction to Data base and DBMS • Why we need DBMS? • Type of DBMS: Relational DBMS, Object Oriented DBMS, Network DBMS, Hierarchical DBMS & their uses. • Benefits of RDBMS • Architecture of RDMBS • Working with Tables, Rows, Attributes, Data Types • Concept of Key Attribute, Primary Key, Candidate key, Concepts of Foreign Key, Integrity Constraints.
Query Languages (34 hrs) • Create Data base using DDL • Create Table use DDL • Altering table using DDL • Inserting Data using DML • Updating Data using DML • Deleting Data using DML • Fetching Data from table using Select query using various SQL clauses and Operators • Executing nested queries	Query Languages (8 hrs) • Introduction to Query language • Structured Query Language • Type of SQL Language : DDL, DML,TCL • DDL: CREATE, DROP , ALTER • DML: SELECT, INSERT, UPDATE, DELETE • SQL clauses: SELECT, FROM, WHERE, GROUP BY, HAVING, ORDER BY • Various Operators: =. <, >, ^, v, AND, OR, BETWEEN, IN, Like (%, _) • Group Functions: MAX (), MIN (), SUM(), COUNT() • Nested Query

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Laboratory and practical work
- Viva-voce

UNIT - 2.3
SUBJECT CODE: CCSE1-211
PROGRAMMING CONCEPTS USING PHP AND MySQL

LEARNING OUTCOMES:

After undergoing this unit student will be able to:

- Create small programs using basic PHP concepts.
- Apply In-Built and create user defined functions in PHP programming.
- Design and develop a Web site using form controls for presenting web based content.
- Debug the Programmes and Create Dynamic Website/Web based Applications, using PHP, MySQL database

PRACTICAL (96 Hours)	**THEORY (32 Hours)**
Introduction to PHP (22 hrs) • Installing PHP for (Windows, Wamp server, XAMP server) • Integrate HTML with PHP • Write a PHP script to display Welcome message. • Write a PHP script to demonstrate arithmetic operators, comparison operator, and logical operator. • Write PHP Script to generate result and display grade. • Write PHP Script to find maximum number out of three given numbers.	• Configuration of PHP, Apache Web Server, MySQL and Open Source • Relationship between Apache, MySQL and PHP (AMP Module) • PHP Structure and Syntax • Constants, Variables: Static and Global Variable • Conditional Structure and Looping, PHP operators • User Defined function, argument function, variable function, Return function (9 hrs)
Working With Functions (24 hrs) • Write PHP script to demonstrate Variable function • Write PHP script to obtain factorial Using function • Write PHP script to demonstrate string function. • Write PHP script to demonstrate Date functions. • Write PHP script to demonstrate Math functions. • Write PHP script to demonstrate Array functions database using PHP	Introduction to: • Variable Functions • string functions • MATH functions • Date functions • Array Functions (9 hrs)
Working with DATA and Forms (20 hrs) • Write PHP script to demonstrate File functions. • Create student registration form using text box, check box, radio button, select, submit button. • Combine HTML and PHP codes together on single page, Redirecting the user. • Create Website Registration Form using text box, check box, radio button, select, submit button.	• Reading data using Form Controls - Text Fields, Text Areas, Check Boxes, Radio Buttons, List Boxes, Password Controls, Hidden Controls, Image Maps, File Uploads, Buttons • Submitting form values, using $_Get and $_Post Methods, $_REQUEST • Accessing form inputs with Get/Post functions (8 hrs)

• Display user inserted value in new PHP page.	
Cookie, Session and Error Handling (15 hrs) • Setting a cookie with PHP. • Deleting a cookie. • Creating session cookie. • Working with the query string • Creating query string. • Starting and Destroying session • Working with session variables, Passing session IDs • Write two different PHP script to demonstrate passing variables through a URL. • Write two different PHP script to demonstrate passing variables with sessions. • Write PHP script to demonstrate passing variables with cookies. • Write a program to keep track of how many times a visitor has loaded the page. • Write an example of Error-handling using exceptions.	• Introduction to cookies and sessions • Error Types in PHP • Error/Exception handling in PHP (4 hrs)

Database Connectivity using MYSQL (15 hrs) • Installation of MySQL • Integration of PHP with MySQL • Connection to the MySQL Database • Write a PHP script to connect MySQL server from your website. • Write a program to read customer information like cust_no, cust_name, Item_purchase, and mob_no, from customer table and display all this information in table format on output screen. • Write a program to edit name of customer to “surbhi” with cust_no =1, and to delete record with cust_no=3. • Write a program to read employee information like emp_no, emp_name, designation and salary from EMP table and display all this information using table format. • Create a dynamic web site using PHP and MySQL.	• Concepts of MySQL • MySQL structure and syntax • Types of MySQL tables and Storage engines • MySQL commands (2 hrs)

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Laboratory and practical work
- Viva-voce

UNIT - 2.4
SUBJECT CODE: CCSE1-212
MULTIMEDIA AND CREATIVE DESIGN

LEARNING OUTCOMES:
After undergoing this unit student will be able to:

- Draw pictures using pixels and bitmapped image
- Make a simple digital collage for a project
- Create, animated graphics, add sound and inter-activity.
- Make audio and video movies with multimedia effects

PRACTICAL **(80 Hours)**	**THEORY** **(16 Hours)**
Adobe Photoshop **(30 hrs)** **Working with Images:** Zooming & Panning an Image • Working with Multiple Images, Rulers, Guides & Grids • Undoing Steps with History **Resizing & cropping images** : • Pixels & Resolution • The Image Size Command • Resizing for Print & Web • Cropping & Straightening an Image • Adjusting Canvas Size **Working with basic selection Tools:** • Selecting with the Elliptical Marquee Tool • Using the Magic Wand & Free Transform Tool • Selecting with the Regular & Polygonal Lasso Tools • Using the Magnetic Lasso Tool • Using the Quick Selection Tool & Refine Edge **Getting started with layers:** • Working on background Layer • Creating, Selecting, Linking & Deleting Layers • Locking & Merging Layers • Copying Layers, Using Perspective & Layer Styles • Introduction to Blending Modes • Blending Modes, Opacity & Fill • Creating & Modifying Text **Painting in photoshop**: Using the Brush Tool • Creating & Using Gradients • Creating & Working with Brushes	**Adobe Photoshop** **(6 hrs)** • Introduction to images, common graphics, Pixels, resolution. • Understand the following formats:- ai, pdf, eps, svg, svgz, psd, bmp, gif, jpg, pcx, pct, png, raw, sct, tga, tiff, vst. • Fundamental concept of Photoshop tools, creating and modifying layers, controlling transparency-opacity and blends modes, layer styles and layer groups, filters and effects, • Introduction to various shortcuts to work Efficiently

• Using the Pencil & Eraser Tools • Painting with Selections **Photo retouching:** The Red Eye Tool • The Clone Stamp Tool • The Patch Tool & the Healing Brush Tool • The Spot Healing Brush Tool • The Color Replacement Tool • The Toning & Focus Tools **Working with the pen tool** Understanding Paths & the Pen Tool • Creating Straight & Curved Paths • Creating Combo Paths • Creating a Clipping Path **Creating special effects** Getting Started with Photoshop Filters • Creating Text Effects • Applying Gradients to Text **Exporting your work** Saving with Different File Formats • Saving for Web & Devices	
Flash (25 hrs) • Drawing with Brush and Paint tool on Stage and Work Area. • Design and Animate Characters in Flash. • Work with text tool on Layer and layer folder - Adding a Border to Text in Flash • Create Animations Using Shape Tweens - Creating an Oscillating Shape Tween • Create animations using Motion Tweens - Creating a Rotating Motion Tweens • Create a Rotating Star Motion Tweens • Create and animating masks • Create a Flying Spinning Object • Moving Objects Along a Path • Create and Import Graphics using Graphic symbols.	**Flash (5 hrs)** • About Flash and General overview – Stage and Work area of Flash, using guides, grid & rulers. • Using frames and key frames, Working with time line. • Using layers – to create a layer, to create a layer folder, to show or hide a layer or folder, to view the contents of the layer as outlines, to change the layer height in the timeline, to change the order of the layers or folders. • Using Guide layers. • Drawing in Flash – to draw with a pencil tool, to paint with a brush tool, to draw with pen tool. • Using colors in Flash, to use a gradient fill. • Importing Artwork, Video and Audio. • Different file formats in Video & Audio. Flash • Compatible Audio & Video file formats
Corel Draw (25 hrs) • Use Customizing Options in	**Corel Draw (5 hrs)** • Basics of CorelDraw, such as creating

CorelDraw. • Identify tools in the toolbox and use several common tools **Using text and Color:** • Working with paragraph text. • Working with color. • Working with Special text effects. **Working on Layouts and layers:** • Special page layouts. • Arranging Objects. • Using layers. **Work on Styles and templates.** **Work with Advanced Effects:** • Custom creation tools. • Working with bitmaps.	and saving documents, using fonts, resizing, rotating and moving documents and getting help. • Bitmap and vector effects, layers, lenses and masks, while creating a collage of images and text on a chosen topic. • Introduction to various shortcuts to work Efficiently

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Laboratory and practical work
- Presentation
- Viva-voce
- Drawing

UNIT - 2.5
SUBJECT CODE: CCSE1-213
CONTENT MANAGEMENT SYSTEM

LEARNING OUTCOMES:

After undergoing this unit student will be able to:

- Install and use different content management systems
- Create and publish contents using different themes in CMS
- Create own website and blogging page.
- Use admin panel to set up basic properties of a web page

PRACTICAL (64 Hours)	**THEORY (16 Hours)**
CMS: Wordpress • Installation of Wordpress. • Explore various components of Admin Panel. • Changing and setting-up various themes available on wordpress website or embed custom theme. • Upload a custom header, add more content with widgets, setting custom fonts and colors etc. • Create various types of menus and their related functions. • Create and publishing a Post. • Create a page and posting it to show on user end. • Implement various functions like tag a post, set favourite a post, bookmarking social networking site to a post. • Create a blogging page or a discussion forum by using WordPress. (48 hrs)	• Concept and fundamentals of various CMS like Wordpress, Joomla etc. • Concept and introduction of pages, post and menus and widgets etc. (11 hrs)
CMS: Joomla • Install Joomla CMS. • Explore admin panel components and front end features. • Set-up home page, various other pages, menus, footer section on front end. (16 hrs)	• Concept and introduction of Joomla CMS (5 hrs)

Means of Assessment

- Assignments and quiz/class tests
- Mid-term and end-term written tests
- Laboratory and practical work
- Viva-voce
- Software installation and operation

UNIT – 2.6
SUBJECT CODE: CCSE1-214
PROJECT WORK (48 Hours)

LEARNING OUTCOMES:

After undergoing this unit student will be able to:

- Implement the theoretical and practical knowledge and skills gained through various units into an application suitable for a real practical working environment, preferably in an industrial environment.
- Explain the working of industrial environment and its work ethics.
- Identify and contrast gap between the technological knowledge acquired through curriculum and the actual industrial need and to compensate it by acquiring additional knowledge and skills, as required.
- Work in collaboration and prepares project report.
- Troubleshoot hardware and software problems.

Project Work aims at developing innovative skills in the students whereby they apply in totality the knowledge and skills gained through various units in a solution of particular problem or by undertaking a project. The individual students have different aptitudes and strengths. Project work, therefore, should match the strengths of students.

For this purpose, students should be asked to identify a project execute the same. It is also essential that the trainer/instructor/faculty of the trade conducts a brainstorming session to identify suitable project assignments for the students.

The project assignment can be individual assignment or a group assignment. There should not be more than 3 students, if the project work is given to a group.

The students should identify themselves or accept the given project assignment at least two to three months in advance. The project work identified in collaboration with industry should be preferred. trainer/instructor/faculty is expected to guide the project work of all the students.

The project assignments may consist of:

- Installation of computer systems, peripherals and software
- Web page designing including database connectivity and Web Hosting
- Database applications
- Networking (Cabling, Hubs, Switch etc)
- Software applications
- Fabrication of components/equipment (computer related components)
- Fault-diagnosis and rectification of computer systems and peripherals
- Multimedia Applications
- Computer Graphics
- Desktop Publishing
- Configuration of Network Operating System (Windows, Linux)

The following organizations may be considered for arranging the project based professional training:

- IT industries
- Telecommunication industries
- Police Department/Cyber Crime Divisions/Forensic Departments
- Industries dealing with Networking
- Industries dealing with Hardware and Software maintenance
- Start-ups dealing with Software development and Hardware Installation/ maintenance
- Research projects in Government institutions.

Means of Assessment

- Assignments and quiz/class tests
- Report writing
- Viva-voce

SUBJECT CODE: CCSE1-216
INDUSTRIAL TRAINING – II (4 Weeks)

The purpose of industrial training is to:

Develop understanding regarding the size and scale of operations and nature of industrial/field work in which students are going to play their role after completing the courses of study.

- Develop confidence amongst the students through firsthand experience to enable them to use and apply institute based knowledge and skills to perform field activities
- Develop special skills and abilities like interpersonal skills, communication skills, attitudes and values.

It is needless to emphasize further the importance of Industrial Training of students during their one-year certificate programme. It is industrial training, which provides an opportunity to students to experience the environment and culture of world of work. It prepares students for their future role as skilled person in the world of work and enables them to integrate theory with practice.

An external assessment of 100 marks have been provided in the study and evaluation scheme of 2nd semester. Evaluation of professional industrial training report through viva-voce/presentation aims at assessing students understanding of materials, industrial process, practices in industry/field organization and their ability to engage in activities related to problem solving in industrial setup as well as understanding of application of knowledge and skills learnt in real life situations.

The instructor along with one industrial representative from the concerned trade will conduct performance assessment of students. The components of evaluation will include the following:

a) Punctuality and regularity 20%
b) Industrial training report 50%
c) Presentation and viva-voce 30%

7. RESOURCE REQUIREMENTS

7.1 LIST OF TOOLS/EQUIPMENT

Sr. No.	Name of the Item	Quantity (in Numbers)
1.	Desktop Computers With latest configuration available in the market.	30
2.	Laptop with latest configuration available in the market	01
3.	Wi-Fi Router, Modem	01
4.	Internet connection (With high speed)	As required
5.	Laser Printer	02
6.	Optical Scanner	01
7.	Digital Web Cam (With High Resolution)	01
8.	DVD Writer	01
9.	Blu-ray writer	01
10.	LCD Projector with antiglare screen	01
11.	2 KVA on line UPS	02
12.	Crimping tool RJ45/RJ11	04
13.	Barcode scanner	01
14.	Digital mulitmeters, 3.5 digit hand held type	10
15.	USB mini dongle for Bluetooth devices connection	10
16.	External hard disk	02
17.	Power meters	04
18.	Cabinets (PC) of different models	08
19.	Mother boards (Different type)	08
20.	Processors of different make	08
21.	Hard Disks (ITB)	08
22.	Optical Drives (CD ROM)	08
23.	Card readers	10
24.	Memory cards	10
25.	Soldiers	10
26.	Pen Drive different capacity	08
27.	Hub/Switch (8 port/24 port)	01 each
28.	Network Rack	01
29.	Computer Tool Kits	10
30.	Cutter	10

LIST OF SOFTWARE

(All the software should be of latest version available in the market)

Sr. No.	Name of the Item	Quantity (in Numbers)
1.	Ms-Office	As per requirement
2.	Anit-Virus	As per requirement
3.	Flash, Photoshop and Coral Draw	As per requirement
4.	Open source software	As per requirement
5.	Data recovery Software	04

7.2 LIST OF CONSUMABLES

Sr. No.	Name of the Item	Quantity (in Numbers)
1.	White Board markers	15
2.	Duster Cloth(2’ by 2’)	20 Pcs
3.	Cleaning Liquid 500 ml	2 bottles
4.	Xerox Paper (A4)	As required
5.	Full scale papers (Legal)	2 rims
6.	Cartridges for printer	As required
7.	RJ 45 connectors, RJ 11	As required
8.	Optical mouse	As required
9.	Key board	As required
10.	SMPS	As required
11.	CMOS Batteries	As required
12.	CDs	50
13.	DVDs	50
14.	Wall Clock	1 for theory room, 1 for lab
15.	Soldering wire and paste	As required
16.	Various types of Button Cells	As required
17.	Dry cell	As required
18.	Hand brush	15
19.	RAM DDR3 or higher	As required
20.	VGA and Power Cables	As required

7.3 LIST OF RECOMMENDED BOOKS

1. Trade Theory of COPA by National Instruction Media Institute (NIMI)
2. Trade Practical of COPA by National Instruction Media Institute (NIMI)
3. Trade Assignment of COPA by National Instruction Media Institute (NIMI)
4. Trade Instructor's Guide of COPA by National Instruction Media Institute (NIMI)
5. Learning Desktop Publishing byRamesh Bangia; Khanna Book Publishing Co. Pvt.Ltd., New Delhi
6. Hardware and Software of PersonalComputers bySK Bose; Wiley Eastern Limited, New Delhi
7. HTML, CSS, JavaScript, Perl, Python and PHP by Schafer Textbooks; Wiley India.

8. RECOMMENDATIONS FOR EFFECTIVE CURRICULUM IMPLEMENTATION AND EVALUATION

Since this skill development course is tailor made i.e. designed to meet the requirement of selected group of students for developing desired competencies in the given trade, it is pertinent for trainers to understand the design philosophy and arrange teaching-learning process using appropriate strategies. The following points may be considered by the trainer at the time of planning the training programme and subsequently during the implementation and evaluation stages:

1. There are multiple competencies in each unit. The course curriculum also includes a core unit on developing effective communication and entrepreneurial qualities. Each unit has specific competencies which trainees are expected to acquire at the end of the each unit. In order to achieve these competencies, the curriculum describes the practice tasks/exercises and related theoretical knowledge. Time has been allocated for both of these components.

2. The curriculum is designed for contact period of 35 hours per week but can be increased/changed as per convenience of the trainees and the trainer.

3. The trainer will assess the attainment of each specific learning outcome of the individual learner and will maintain record whether the trainee has achieved desired level i.e. Yes/No. In case of 'No' the trainee will work further to learn and attain the desired skills till s/he earns 'Yes'.

4. Each learning outcome will be assessed/tested by the trainee as per acceptable norms and record will be maintained for final certification. The final assessment of skills attained through practice jobs and acquisition of relevant knowledge should preferably be carried out appropriately.

5. The examiner will set an objective type question paper for theory examinations of each unit under final assessment. Preferably the question paper should aim at testing the understanding of basic principles and concepts by students and their applications.

6. The final assessment of practical skills development should not be limited to testing a few units, but should spread over to all the acquired skills in an integrated manner. It should ultimately assess the ability of the student to accomplish the desired learning outcomes of the programme.

9. LIST OF CONTRIBUTORS/EXPERTS

a) Following experts participated in the workshop to design curriculum of certificate programme in 'Computer Maintenance and Programming Assistant' with NSQF alignment for MRSPTU, Bathinda on 29-30 June, 2016 at NITTTR, Chandigarh.

1.	Dr. Ashok Kumar Goel, Professor & Head, Electronics and Communication Engineering Department and Director, College Development Council, MRSPTU Campus, Dabwali Road, Bathinda, Punjab
2.	Dr. Naveen Aggarwal, Associate Professor, University Institute of Engineering and Technology (UIET), Panjab University, Sector-25, Chandigarh
3.	Shri Vipin Gupta, Managing Director, U-Net Solutions, Moga, Punjab
4.	Shri N.S.Dhindsa, Govt. Polytechnic College for Girls, Patiala
5.	Shri Santosh Kumar Yadav, Lecturer, CCET, Diploma Wing, Sector-26, Chandigarh.
6.	Smt. Sonu Satija, Instructor, Govt. Industrial Training Institute for Women, Chotti Baradari, Patiala
7.	Ms. Navjot Kaur, Group Instructor, Head Quarter, Department of Technical Education and Industrial Training, Sector 36,Chandigarh
8.	Shri Jasvinder Singh, Govt. Industrial Training Institute, Phase-5, Mohali, Punjab
9.	Ms. Manpreet Kaur, Govt. Industrial Training Institute for Women, Sector-11, Chandigarh
10.	Ms. Seema Bhalla, Instructor, Govt. Industrial Training Institute, Patiala
11.	Shri Y. Jagadeesh, Govt. Industrial Training Institute, Sector-28, Chandigarh
12.	Shri Amrendra Sharan, Junior System Programmer, Computer Science Department, NITTTR, Chandigarh
13.	Shri Pardeep Kumar Bansal, System Programmer, Computer Science Department, NITTTR, Chandigarh
14.	Shri Alok Deep, Computer Science Department, NITTTR, Chandigarh
15.	Dr. AB Gupta, Professor & Head, Curriculum Development Centre, NITTTR, Chandigarh
16.	Prof. PK Singla, Associate Professor, Curriculum Development Centre, NITTTR, Chandigarh **Coordinator**

b) Following experts participated in the workshop to design curriculum of certificate programme in 'Computer Maintenance and Programming Assistant' with NSQF alignment for MRSPTU, Bathinda on 29 July, 2016 at NITTTR, Chandigarh.

1.	Smt. Sonu Satija, Instructor, Govt. Industrial Training Institute for Women, Chotti Baradari, Patiala
2.	Smt. Rekha Handa, Instructor, Govt. Industrial Training Institute, Sector 28, Chandigarh

c) Following experts participated in the workshop to review the curriculum of certificate programme in 'Computer Maintenance and Programming Assistant' for MRSPTU, Bathinda on 20 January, 2017 at NITTTR, Chandigarh:

1.	Dr. MM Malhotra, Ex-Principal, TTTI, Chandigarh
2.	Shri Arvind Dixit, Advance Technology, Sector 24, Chandigarh
3.	Dr. Ashok Kumar Goel, Director, College Development Council, MRSPTU, Bathinda, Punjab
4.	Shri Kulmohan Singh, Ex-HOD, Electrical Engg., CCET (Diploma Wing), Sector 26, Chandigarh
5.	Shri HS Kalra, Ex-Principal, Govt. Industrial Training Institute, Sector-28, Chandigarh
6.	Shri Rakesh Goel, Estate Officer, NITTTR, Chandigarh
7.	Shri Pritpal Singh Aulakh, GZSCCET, Bathinda
8.	Shri Naib Singh, Sr. Technician, GZSCCET, Bathinda
9.	Shri Jagdip Singh, , Sr. Technician, GZSCCET, Bathinda
10.	Prof. PK Singla, Associate Professor, Curriculum Development Centre, NITTTR, Chandigarh
11.	Dr. AB Gupta, Professor & Head, Curriculum Development Centre, NITTTR, Chandigarh **Coordinator**