CURRICULUM

Technical School Leaving Certificate

Computer Engineering

(18 months program)

Council for Technical Education and Vocational Training

Curriculum Development Division

Sanothimi, Bhaktapur

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Table of Contents

Introduction:
Nepal Government, Ministry of Education implemented the letter grading system in SLC from 2072 B.S. The door of TSLC programme is open for those students who have appeared in SLC exam and achieved any GPA and any grade in each subject. Focusing on such students the curriculum of TSLC of 29 months and 15 months have been converted into 18 months to create uniformity among different TSLC programme.

This curriculum is designed to produce basic level human resources in the field of Computer engineering equipped with knowledge, skills and attitude necessary for this level of technicians so as to meet the demand of such technician in the country.

Title:
The title of the programme is TSLC in Computer Engineering.

Aim:
The aim of the programme is to produce competent human resources in the field of Computer Engineering or ICT Industries who can work in rapid growing Computer Applications, Computer Programming and Designing, Networking as well as can provide service in communication fields.

Objectives:
After completing this curricular program, the students will be able to:
- help to uplift the awareness about the ICT
- work in the fast growing field of ICT industries, government institutions as well as international and non-governmental organisations
- process the related data
- work in Computer Programming and Networking
- develop small programs on graphic design and web development and
- create self-employment opportunity to reduce the unemployment problems which helps to alleviate the poverty in the country.

Programme Description:

This programme is based on the job required to be performed by the Junior Computer Technicians in computer Designing, Programming, Networking and Communication service sectors. It is related to computer application and communication system installation and maintenance. Therefore, this curriculum is designed to provide knowledge and skills focusing on Computer Engineering related to the occupation. The curricular program consists of one year in house course and six months on the Job Training.
Similarly, the On-the-Job Training (OJT) for 6 months insists on the application of learned skills and knowledge in formal setting as well as the provision of OJT is also included to establish a linkage with employers and provides hands on work experience to students and promotes employability of graduates. Moreover, OJT takes place immediately after completing yearly final examination.

Course Duration:

This course will be completed within 18 months (40 hrs./week X 39 weeks = 1560 hrs.) class plus 6 months (40 hrs./week X 24 weeks = 960 hrs.) on the job training (OJT).

Entry criteria:

Individuals with following criteria will be eligible for this program:
- SLC with any grade and any GPA (Since 2072 SLC).
- SLC appeared (Before 2072 SLC)
- Pass entrance examination administered by CTEVT

Group size:
The group size will be maximum 40 (forty) in a batch.

Medium of Instruction:
The medium of instruction will be in English and/or Nepali language.

Pattern of Attendance:
The students should have minimum 90% attendance in theory classes and practical/performance to be eligible for internal assessments and final examinations.

Instructors' Qualification:
- Instructors should have Bachelor Degree in Computer Engineering
- Diploma in Computer Engineering with minimum 5 years practical based experiences.
- The demonstrator should have Diploma in Computer Engineering with minimum 2 years practical based experiences.
- Good communicative/instructional skills

Teacher and Student Ratio:
- Overall at institutional level: 1:10
- Theory: 1:40
- Practical: 1:10
- Minimum 75% of the teachers must be fulltime

Instructional Media and Materials:
The following instructional media and materials are suggested for the effective instruction, demonstration and practical.
- Printed media materials (assignment sheets, handouts, information sheets, procedure sheets, performance check lists, textbooks, newspaper etc.).
- Non-projected media materials (display, models, photographs, flip chart, poster, writing board etc.).
- Projected media materials (multimedia/overhead transparencies, slides etc.).
- Audio-visual materials (films, videodiscs, videotapes etc.).
- Computer-based instructional materials (computer-based training, interactive video etc.)

Teaching Learning Methodologies:

The methods of teaching for this curricular program will be a combination of several approaches such as;
- Theory: lecture, discussion, assignment, group work, question-answer.
- Practical: demonstration, observation, simulation, role play, guided practice and self-practice.

Evaluation Details:
- The ratio between the theory and practical tests will be as per the marks given in the course structure of this curriculum. Ratio of internal and final evaluation is as follows:

S.N.	Particulars	Internal Assessment	Final Exam	Pass %
1.	Theory	50%	50%	40%
2.	Practical	50%	50%	60%

- There will be three internal assessments and one final examination in each subject. Moreover, the mode of assessment and examination includes both theory and practical or as per the nature of instruction as mentioned in the course structure.
- Every student must pass in each internal assessment to appear the final exam.
- Continuous evaluation of the students' performance is to be done by the related instructor/ trainer to ensure the proficiency over each competency under each area of a subject specified in the curriculum.
- The on-the-job training is evaluated in 500 full marks. The evaluation of the performance of the student is to be carried out by the three agencies; the concerned institute, OJT provider industry/organization and the CTEVT Office of the Controller of Examinations. The student has to score minimum 60% for successful completion of the OJT.

Grading System:

The grading system will be as follows:

Grading	**Overall marks**
Distinction	80% or above
First division	75% to below 80%
Second division	65% to below 75%
Third division	Pass aggregate to below 65%

Certificate Awarded:

The council for technical education and vocational training will award certificate in "**Technical School Leaving Certificate in Computer Engineering**" to those graduates who successfully complete the requirements as prescribed by the curriculum.

Job Opportunity:

The graduate will be eligible for the position equivalent to Non-gazetted 2nd class/level 4 (technical) as Junior Computer Technician or as prescribed by the Public Service Commission.

Course Structure

S. N.	Course Title	Nature	Class/ Week	Total Class/Year			Full Marks		
				T	P	Total	T	P	Total
1	Fundamental of Information Technology	T+P	6	70	164	234	30	120	150
2	Graphic & Web Development	T+P	6	57	177	234	30	120	150
3	Database Management System	T+P	6	62	172	234	30	120	150
4	Computer Programming	T+P	6	48	186	234	30	120	150
5	Computer Hardware & Networking	T+P	6	44	190	234	30	120	150
6	System Analysis & Design	T+P	2	32	46	78	20	30	50
7	Communicative skills	T+P	2	23	55	78	20	30	50
8	Entrepreneurship Development	T+P	2	30	48	78	20	30	50
9	Electro Technology	T+P	2	25	53	78	20	30	50
10	Project Work	P	2	0	78	78	0	50	50
	Sub Total		**40**	**391**	**1169**	**1560**	**230**	**770**	**1000**
	On the **J**ob Training (6 Months)					960			500
	Total					**2520**			**1500**

T: Theory
P: Practical

Fundamental of Information Technology

Total: 234 hours
Theory: 70 hours
Practical: 164 hours

Course Description:
This course is designed to provide basic knowledge in information and communication technology. It intends to provide information on the history of computer, operating systems and their application and skills on word processing, spreadsheet, presentation, and email & internet program. The trainee will be introduced to the computer application and information technology.

Course Objectives:
At the end of this course students will be able to:
- Interact with Operating System (Microsoft Window Program)
- Prepare documents in word processing program.
- Prepare worksheets in Excel program.
- Prepare presentations in PowerPoint program.
- Send & receive email.
- Browse web sites.

Module 1: Work in Microsoft Window program.

S. N.	TASK	RELATED KNOWLEDGE	TIME (HOURS)		
			T	P	Total

1	**Familiarize with computer system**
	♦ Identify Computer components
		♦ Concept of information technology
		♦ Importance and use of information technology
		Computer
		♦ Introduction
		♦ Characteristics
		♦ History
		♦ Use and advantage
		♦ Generation & their features
		♦ Classification
		♦ Block diagram
		♦ Computer System & components
		  ♦ Input units
		  ♦ Processing units
		  ♦ Output units
		  ♦ Memory and storage units
		♦ Computer peripherals and its functions
		Hardware and software
		♦ Introduction
		♦ Types
			26	1	27

2	**Start Operating system**
	♦ Turn on/off,
	♦ Restart
	♦ Hibernate
	♦ Log on/off
		Operating system
		  ♦ Introduction
		  ♦ Function
		  ♦ Types (GUI, CUI)
		♦ Introduction to MS Windows
		♦ Booting and its types
			2	1	3

3	**Perform Typing** ♦ Identify Keyboard parts(Home row, Top Row, Bottom row, control/special keys, Number keys & Function keys ♦ Practice Home Row ♦ Practice Top Row ♦ Practice Bottom Row ♦ Practice All ♦ Install Fonts ♦ Install Nepali Unicode ♦ Perform Unicode setting	♦ Introduction of Keyboard parts ♦ Position of fingers ♦ Typing basic ♦ Nepali fonts and Unicode	½	12	12 ½
4	**Customize Desktop** ♦ Identify Desktop components ♦ Adjust Taskbar ♦ Adjust/Change Icon ♦ Change Wallpaper ♦ Apply screensaver ♦ Adjust Screen resolution ♦ Change Screen Appearance ♦ Change Theme ♦ Add/Remove Gadgets ♦ Add/Remove Sticky notes ♦ Print Screen ♦ Capture a portion of a screen (snipping tools) ♦ Adjust Date and Time ♦ Resize windows ♦ Switch windows ♦ Arrange, view, sort windows/icon ♦ Empty recycle bin ♦ Show/hide desktop Icon ♦ Create program shortcut to desktop ♦ Add/remove program to start menu	♦ Desktop Components ♦ Pixel and resolution ♦ Use of relevant shortcut keys	1	6	7

5	**Operate Window Applications** ♦ Apply paint ♦ Use calculator ♦ Use WordPad ♦ Use character map ♦ Apply sound recorder ♦ Use Window media player	**Window Applications** ♦ Introduction to Paintbrush, Calculator, Imaging, Notepad, WordPad, character map, Multimedia, media files	1	4	5
6	**Work with file/ Folder** ♦ Create/rename/copy/ move/delete /restore files and folders ♦ Search files/folders ♦ Create short cut ♦ Change files and folders attributes ♦ Use windows explorer ♦ View files and folder properties ♦ Show/hide files and folders ♦ Compress folder ♦ Extract files/folder ♦ Handle storage devices ♦ Burn files and folders ♦ Format drives ♦ Import files from scanner, removable drives and camera ♦ Scan for virus	**File/ Folder** ♦ Concept of files, folders and extension ♦ Concept of Drive ♦ Wild card character ♦ Menu and sub menus ♦ Concept of short cut ♦ Storage devices (pen drive, memory card, CD/DVD/blu-rays) ♦ Resolution, DPI & Scanner ♦ Use of Recycle bin	2	8	10

7	**Manipulate control panel**	**Control Panel**	1	2	3
	♦ Change control panel views ♦ Apply regional setting, ♦ Adjust date and time, appearance of window elements ♦ Apply desktop icons and effect ♦ Display of colors and resolutions ♦ Adjust taskbar and start menu ♦ Adjust keyboard, mouse and sound ♦ Add/remove programs ♦ Perform device manager	♦ Use of control panel ♦ Regional setting, Date and time, Screen saver, Appearance of window elements, Desktop icons and effect, Display of colors and resolutions, add remove programs, device manager,			
8	**Maintain & optimize computer**	**Maintain & optimize computer**	2 ½	8	10 ½

	♦ Perform disk clean up
	♦ Perform disk defragment
	♦ Repair hard disk errors
	♦ Adjust power option
	♦ Update windows
	♦ Adjust firewall
	♦ Clear temporary files and cookies
	♦ Schedule task
	♦ Modify startup program
	♦ Perform scan
	♦ Remove/quarantine infected files
	♦ Update virus database
	♦ Adjust option for scanning
	♦ Setup parental control
	♦ Create user account
	♦ Remove user account
	♦ Change user account properties
	♦ Apply security, permission and group policies
		♦ Introduction to system tools
		♦ Importance of windows update and firewall
		♦ Computer Virus
		  ♦ Introduction
		  ♦ Types
		  ♦ Effects
		  ♦ Virus Spread
		♦ Computer antivirus and its types
		♦ Virus protection
		♦ User account and its types
		♦ Security, permission and group policies
		♦ Importance of backup
		♦ Use of task manager			

			T	P	Total
♦ Create/restore system restore point ♦ Adjust windows task manger ♦ Use help and support					
Sub-Total			36	42	78

Module 2: Operate Word Processing Program

S. N.	TASK	RELATED KNOWLEDGE	TIME (HOURS)		
			T	P	Total
1	**Prepare document file** ♦ Identify Ms Word components ♦ Start Ms Word ♦ Create Document ♦ Open Document ♦ Save Document ♦ Close Document ♦ Store document in different locations and different file type using Save As. ♦ Protect Document ♦ Exit Ms Word	♦ Introduction to word processing ♦ Introduction to Ms-Word and its components ♦ Default extension and location ♦ Template ♦ Use of relevant shortcut keys	2 ½	2	4 ½
2.	**Work with text, paragraph, graphics, charts, objects and documents** ♦ Select, move, delete, text/paragraph/objects ♦ Cut, copy, paste, undo and redo options ♦ Use clipboard ♦ Change font, font size, font color, font style, effects, underline style ♦ Change alignment, adjust character spacing, change case, create drop cap ♦ Adjust spacing, find & replace text/formatting, check spelling & grammar, apply indention, use tab setting, bullets and numbering, symbols, format painter, clear formatting, apply word count, use thesaurus ♦ Add and format picture, clipart, shapes, smart art, chart, text box and word art ♦ Crop picture, adjust size, rotate picture, insert, caption, insert file/object, equation ♦ Arrange position and text wrapping	♦ Concept of text, paragraph, graphics, charts, objects in documents ♦ Use of relevant shortcut keys	2	9	11

3.	**Format document** ♦ Setup/change page margin ♦ Select paper size & orientation, apply/remove background ♦ Create bookmark ♦ Insert page breaks, section break, page number, headers and footers ♦ Insert hyperlink, footnote, endnote, table of contents, reference ♦ Apply track change ♦ Compare document ♦ Create mail merge ♦ Record macro	♦ Bookmark, Page breaks, footnote, endnote ♦ Table of Contents, cross reference ♦ Use of mail merge ♦ Track change and record macro ♦ Use of relevant shortcut keys	2	12	14
4.	**Work with table** ♦ Create table, draw table ♦ Insert cell/row/column ♦ Delete Cell/Row/Column/Table ♦ Merge Cell, Split Cell or table ♦ Apply auto fit table ♦ Distribute rows/column evenly ♦ Adjust Cell/Row/Column ♦ Apply Borders and shading ♦ Choose text direction & align text ♦ Show/hide gridlines ♦ Convert text to table or vice versa ♦ Sort the contents of a table ♦ Repeat table headings ♦ Apply formula	♦ Concept of cell, row, column, table and its properties ♦ Use of relevant shortcut keys	1 ½	6	7 ½
5	**View document** ♦ Apply/remove outline view ♦ Apply/Remove print layout view ♦ Show/Hide rulers and thumbnails ♦ Zoom documents ♦ Arrange window ♦ Split window ♦ Remove split	♦ Use of different view and windows ♦ Use of relevant shortcut keys	½	2	2 ½
6.	**Print document** ♦ Preview document ♦ Print Document (All, current page, Pages, selected text, Even page, odd page & no of copies) ♦ Adjust print properties/preference	♦ Printer and printer properties ♦ Use of relevant shortcut keys	½	2	2 ½

7	**Customize Ms-Word** ♦ Customize Quick Access toolbar ♦ Move Quick Access toolbar ♦ Hide/unhide the ribbon ♦ Set the default font ♦ Change Autocorrect option ♦ Change Default save location ♦ Customize commands and keyboard shortcuts ♦ Add Add-Ins ♦ Apply word option	♦ Use of word option	1	2	3
8	Project Work			5	5
Sub-Total			**10**	**40**	**50**

Module 3: Work in MS EXCEL Program

S. No.	TASK	RELATED KNOWLEDGE	TIME (HOURS)		
			T	P	TOTAL
1.	**Familiarize with Excel environment** ♦ Identify Ms Excel components ♦ Start Ms Excel ♦ Exit Ms Excel ♦ Create Workbook ♦ Open Workbook ♦ Save/As Workbook ♦ Close Workbook ♦ Protect Workbook	♦ Introduction to Spreadsheet program ♦ Introduction to excel and its component ♦ Introduction to workbook, default extension and location ♦ Use of relevant shortcut keys	1	2	3
2.	**Format workbook/ spread sheet** ♦ Cut, Copy, Paste, Paste special, Deleting, Clearing data and cells. Inserting cells, rows and columns ♦ Use clipboard ♦ Inserting, moving, coping, coloring, deleting, renaming worksheets ♦ Insert cell, row, column ♦ Show/hide row/column/sheet ♦ Adjust column/row ♦ Format cell (number format, alignment, fonts, border &	♦ Introduction to cell, row, column, worksheet ♦ Paste and paste special ♦ Advantage of protecting cells/sheet/workbook ♦ Use of relevant shortcut keys	1	6	7

	shading, fill), lock/protect cell/worksheet, clear formats ♦ Find and replace, merge cell ♦ Apply cell styles, table format				
3.	Manipulate data ♦ Fill data ♦ Apply flash fill ♦ Sort data ♦ Filter data including advance filter ♦ Apply data validation ♦ Apply conditional formatting ♦ Subtotal, group/ungroup data, ♦ Remove duplication ♦ Pivot table, chart ♦ Record macro ♦ Consolidate data ♦ Use what if analysis ♦ Apply add-ins ♦ Get external data	♦ Use of Filter ♦ Introduction to data validation & conditional formatting ♦ Use of data validation & conditional formatting ♦ Pivot table, chart and macro ♦ Data consolidate and what if analysis ♦ Use of relevant shortcut keys	3	8	11
4.	**View workbook** ♦ Apply/remove workbook views ♦ Show/hide grid lines, formula bar, heading ♦ Zoom worksheet ♦ Arrange, split window, freeze panes	♦ Use of Different workbook views	1	2	3
5.	**Setup page layout and print workbook** ♦ Worksheet Preview and zoom, Page orientation and scale, Headers and Footers, Margins, Page breaks ♦ Repeat row/column heading ♦ Set/clear print area ♦ Printing all or selected parts of a	♦ Printer and printer driver	1	2	3

S. No.	TASK	RELATED KNOWLEDGE	T	P	TOTAL
	worksheet ♦ Adjust print properties				
6.	**Work with formula and function** ♦ Apply function/formula ♦ Insert Date & time ♦ Apply Sum, Product, Average, Maximum, Minimum, Rank, Division, Subtract, Power) ♦ Concatenate Text/String ♦ Count Data ♦ Apply Lower, Upper & Proper Function ♦ Apply IF and nested IF function ♦ Simple text, math and lookup function ♦ Apply name	♦ Introduction to formula ♦ Types of formula/functions (Text, Date/Time, lookup, mathematical, logical, financial, statically etc) ♦ Worksheet links and hyperlinks ♦ Define operators ♦ Types of operators (Arithmetic, comparison, reference) ♦ Logical function (AND, OR) ♦ Use of parentheses and IF condition ♦ Relative, mixed and absolute reference ♦ Use of name ♦ Error Type ♦ Use of relevant shortcut keys	2 ½	11	11 ½
7.	**Present data** ♦ Create charts ♦ Modify charts ♦ Insert chart title, data table legends Chart ♦ Show/hide axis, grid lines ♦ Format plot area ♦ Draw and modify shapes and insert a 3D object	♦ Use of Charts ♦ Types of Charts	½	4	4 ½
8.	Project Work			5	5
Sub-Total			**10**	**40**	**50**

Module 4: Work in MS Power Point Program.

S. No.	TASK	RELATED KNOWLEDGE	TIME (HOURS)		
			T	P	TOTAL
1.	**Familiarize with PowerPoint environment** ♦ Identify Ms PowerPoint Component ♦ Start Ms	♦ Introduction to presentation program ♦ Introduction to Ms PowerPoint and its component ♦ Default extension and location	1 ½	2	3 ½

	PowerPoint ♦ Exit Ms PowerPoint ♦ Create Presentation ♦ Open Presentation ♦ Save Presentation ♦ Close Presentation ♦ Protect Presentation ♦ Publish Presentation	♦ Different file types			
2.	**Format slide and presentation** ♦ Insert Slide ♦ Remove Slide ♦ Duplicate Slide ♦ Apply/Modify Themes (Fonts, Color, Effects) ♦ Format Background ♦ Show/Hide Background graphics ♦ Add/Remove Header & Footer ♦ Insert Slide no, Date & Time ♦ Insert Hyperlink ♦ Select Slide Orientation ♦ Apply Template ♦ Apply Master Slides	♦ Themes, Effects & Template ♦ Header & Footer ♦ Define master slide ♦ Use of master slide ♦ Use of relevant shortcut keys	1 ½	4	5 ½
3.	**Add/Modify Objects** ♦ Add picture, clipart, shapes, illustration, tables, smart art, chart, text box , word art , action button, photo album, Sound and video (Movie) ♦ Format illustration, picture, clipart, shapes, tables, smart art, chart, text box , word art , action button, Sound and video (Movie) ♦ Adjust Brightness, Contrast & Color ♦ Crop Picture/Clipart ♦ Adjust Size ♦ Arrange Position &	♦ Concept of clipart, chart, smart art, word art, action button, sound and movie ♦ Use of relevant shortcut keys	1	2	3

	text wrapping ♦ Rotate Picture/Clipart ♦ Insert caption ♦ Insert file/object, symbols				
4.	**Apply Animation Effects** ♦ Apply Custom Animation (Entrance, Emphasis, Exit & Motion Path) ♦ Remove/Modify Animation Effects ♦ Adjust Animation (Start, Property & Speed) ♦ Adjust Effect Option, Timing & Text animation ♦ Apply Slide Transitions ♦ Remove/Modify Slide Transitions ♦ Adjust Transition Sound, Speed, Manual/Automatic	♦ Use of animation ♦ Use of slide transition ♦ Use of relevant shortcut keys	½	4	4 ½
5.	**Perform slide show** ♦ Show presentation from beginning ♦ Show presentation from current slide ♦ Show/Hide Slide ♦ Perform Slide setup	♦ Slideshow ♦ Use of relevant shortcut keys	½	2	2 ½
6.	**View presentation** ♦ Apply/remove Presentation views (Normal, Slide sorter, Slide Master, Note pages, Handout) ♦ Show/Hide grid lines, Zoom Presentation, fit to window ♦ Apply Color, Gray scale & Pure Black & white to presentation	♦ Use of Different views ♦ Use of macros ♦ Use of relevant shortcut keys	½	1	1 ½

S. No.	TASK	RELATED KNOWLEDGE	T	P	TOTAL
	♦ Arrange window ♦ Split window ♦ Add/Run macros				
7.	**Print presentation** ♦ Preview Presentation ♦ Print Presentation (Current Slide, Slides & no of copies ♦ Print Handout & Notes	♦ Printer ♦ Use of relevant shortcut keys	½	2	2 ½
11	**Project Work**			5	5
Sub-Total			**6**	**22**	**28**

Module 5: Work in Email and Internet Browse Program

S. NO.	TASK	RELATED KNOWLEDGE	TIME (HOURS)		
			T	P	TOTAL
1.	Familiarize with Email / Internet / Intranet • Check Internet Connection • Open web browser • Adjust web browser • Open/browse website • Search information on the web • Clear history	♦ Define Internet ♦ Advantages/use of Internet ♦ Internet Service Provider ♦ Internet connection type ♦ Components required for internet connection ♦ Services provided by internet ♦ Define Web Site ♦ Use of Website. ♦ Brief knowledge of home page, web page, web browser, WWW, HTTP, URL, FTP, TCP/IP, Firewall and domain name. ♦ Search engine, searching techniques ♦ Clear history ♦ Useful websites including social network websites	3	3	6
2.	Send / Receive E-mails • Create new email account • Compose mail • Send email • Attach a file • Reply email • Forward email	♦ Define email ♦ Advantages/use of email. ♦ Free email service ♦ Compose, Inbox, attach files, Sent item, Trash, Reply, Forward, CC, BCC.	2	7	9

	• Delete email • Manage/use address book • Print email • Change password	♦ Address book ♦ SPAM, Junk mail ♦ Concept of compressing files/folders			
3.	**Familiarize with Outlook** • Open Outlook • Identify outlook components • Configure outlook express • Compose mail • Send email • Attach a file • Reply email • Forward email • Delete email • Manage/use address book • Print email • Backup contact and email	♦ Concept of Outlook Express ♦ Use of POP, SMTP, IMAP	1	6	7
3.	♦ Download necessary information/software from the net	♦ Concept of upload and download ♦ Download accelerator, Concept of freeware, shareware ♦ File sharing sites	½	2	2 ½
4.	♦ Use Instant Messaging Service (IMS) ♦ Share information through social networking sites	♦ Useful websites including social networking sites, IMS , video conference ♦ Concept of firewall	½	1	1 ½
5.	♦ Scan email ♦ Protect computer from virus and spywares	♦ Computer virus and spywares ♦ Safe internet browsing ♦ Simple defending ways of computer virus when using internet/Email, internet security	1	1	2
Sub-Total			**8**	**20**	**28**

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Graphic & Web Development

Total: 234 hours
Theory: 57 hours
Practical: 177 hours

Course Description:
This course is designed to provide the basic knowledge in graphic design and web development. It intends to provide knowledge and skills on InDesign, Photoshop, Flash, HTML, Dreamweaver and PHP. The trainee will be introduced to the different application related to the graphics design and web development.

Course Objectives:
At the end of this course students will be able to:
- Perform in InDesign Program.
- Design in Photoshop Program.
- Perform in Flash Program.
- Design and develop webs in different tools and application (HTML, Dreamweaver & PHP)**.**

Module 1: Work in InDesign Program.

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			T	P	TOTAL
1.	Familiarize InDesign ♦ Open a new document, columns, save a document and print in InDesign	♦ Introduction to InDesign	1	1	2
2.	Place Text/Graphics ♦ Use Graphics	♦ Types of Graphic images	1	1	2
3.	Handle toolbox ♦ Use Pointer, Square box, Moving a box, Sizing a box, Round edged box, Circle, Oval, Crop, Text tool and Blocking a text	♦ Concept of Crop	½	2	2½
4.	Handle Page Menu ♦ View document, find a page, Insert a page and deleting a page			1	1
5.	Handle Text Attributes ♦ Select Fonts and make Super/ Subscript and Hyphenation ♦ Adjust Type width, Style, Specifications ♦ Add words to the dictionary ♦ Lead and Track	♦ Fonts	½	2	2½
6.	Handle Paragraph Attributes ♦ Perform Justification, Alignment, Force Justify, Tab, Indent, Hanging			1	1

S.N.	TASK	RELATED KNOWLEDGE	THEORY	PRAC	TOTAL
7.	Perform Styles ♦ Perform Definition, Editing, Removing and Tagging			1	1
8.	Create Master Pages ♦ Insert Header, Footer and Page Numbering	♦ Concept of Master Page ♦ Concept of heater footer and page numbering	1	2	3
9.	Handle special effects ♦ Text rotation and special Characters			1	1
10.	Wrap text around graphics ♦ Designate /customize space between/around text & graphics			1	1
11.	Design template ♦ Create, save and use template, Replacing text & graphics	♦ Benefit of Template	1	2	3
12.	Generate/ Manipulate table of contents ♦ Select, generate and regenerate table of contents entries	♦ Concept of Table of Content	1	2	3
13.	Prepare Combine multiple publications ♦ Book option, Publications in the book list and auto renumbering options		½	1	1½
14.	Generate/Manipulate Index ♦ Index entries: show, view in story mode, delete, shortcuts, import, cross-referencing, generate and regenerate ♦ "Find…." option for indexing		½	2	2½
15.	Project Work & Presentation			5	5
Sub-Total			**7**	**25**	**32**

Module 2: Work in Photoshop Program.

S.N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			THEORY	PRAC	TOTAL
1.	Familiarize with Photoshop ♦ The toolbox ♦ Save Images in Photoshop, Format and navigate	♦ The Photoshop Window ♦ Raster and Vector Graphics	1	2	3
2.	Manipulate images ♦ Image, Size Resolution, Cropping		½	2	2½

No.	Topic	Description			
3.	Select Image Areas ♦ Use Lasso Tool ♦ Deselect Areas ♦ Use Crosshair Pointers ♦ Select Polygon Areas ♦ Rectangular and Elliptical Marquees ♦ Use Magic Wand Tool ♦ Use Magnetic Lasso Tool	Introduction to various tools	½	2	2½
4.	Manipulate Selections ♦ Transform Selections, Move Selections, Copy and Save selections, Floating Versus Fixed Selections ♦ Correct Mistakes ♦ Hide and Feather Edges	Introduction to selection tool.	½	2	2½
5.	Image Modes	♦ Mode Characteristics, Colour Modes, Greyscale and Bitmap Modes	1	2	3
6.	Select Colour ♦ Use Colour Palette, Picker, Info Palette, Rearrange Palettes and Eyedropper Tool	♦ Concept of Colour Palette	1	2	3
7.	Paint in Colour ♦ Tools: Line Tool, Paintbrush Tool, Pencil Tool, Rubber Stamp Tool and Paint Selection Masks		½	2	2½
8.	Create/Manipulate layers ♦ Paint with Layers	♦ Concept of layer and its uses	1	2	3
9.	Adjust Images ♦ Adjust Brightness/Contrast, Levels Adjustment layers, Toning Tools and Hue/Saturation			2	2
10.	Save Completed Images ♦ Flatter Images and Saving processes			2	2
11.	Project work			6	6
Sub-Total			**6**	**26**	**32**

Module 3: Perform in Flash Program.

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			THEORY	PRAC	TOTAL
1	Familiarize with Flash ♦ Open and Close Flash	♦ Concept of Flash and Animation	1	1	1
2	View a completed movie ♦ Run the Movie			1	1
3	Including a movie in a web page ♦ Insert movie in web page			1	1
4	Analyze a movie file ♦ View document properties ♦ View the movie clip ♦ View library assets ♦ View Movie Explorer	Introduction to movie file	½	2	2½
5	Create a new document ♦ Open a new file ♦ Define document properties ♦ Specify grid settings ♦ Create and transform gradient background ♦ Name and lock a layer	♦ Description of Document and its properties	1	2	3
6	Create and mask vector art ♦ Add a layer ♦ Create and transform a duplicate shape ♦ Create a "cut out" ♦ Create a mask	Introduction to layer	½	2	2½
7	Tween bitmap effects within a movie clip ♦ Import images into the library ♦ Modify bitmap compression ♦ Create a movie clip symbol ♦ Tween bitmap effects ♦ Test the movie	Introduction to bitmap compression	½	2	2½
8	Load dynamic text at runtime ♦ Import the logo ♦ Create a dynamic text field ♦ Use the load Variables action to load text ♦ Test the movie	Introduction to runtime & logo	½	2	2½

S. N.	TASK	RELATED KNOWLEDGE	THEORY	PRAC.	TOTAL
9.	Add animation and navigation to buttons ♦ Import the library of another FLA file ♦ Align buttons ♦ Enable simple buttons ♦ Modify a button state ♦ Add actions to buttons ♦ Add button navigation	♦ Introduction to library with its uses	1	2	3
10	Add streaming and event sounds ♦ Add a streaming sound ♦ Add an event sound to a button	Introduction to streaming	1	2	3
11	Organize Library panel		1	2	3
12	Familiarise with Action Script and Components	♦ Introduction of Action Script and Components	1	2	3
13	Project work			6	6
Sub-Total			**8**	**27**	**35**

Module 4: Design Webs

4.1: HTML

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			THEORY	PRAC.	TOTAL
1.	Familiarise with HTML ♦ Create HTML Document, Tags, Skeleton & flesh ♦ Text ♦ Images and types ♦ Lists and forms ♦ Tables ♦ Frames	♦ Introduction of HTML ♦ Role, history, versions of HTML. ♦ Types of Tags ♦ Attributes and its properties	2	4	6
2.	Create Links/ Webs ♦ Hypertext basics ♦ Reference documents and its linking			2	2
3.	Design/Manipulate forms ♦ Multi line text areas ♦ Multiple choice elements	♦ Concept of form ♦ Elements of form	1	2	3
4.	Design Tables ♦ Create Tables ♦ Format Tables	♦ Concept of Table and its usage ♦ Table models, definition and types ♦	1	3	4
5.	Design Frames ♦ Create frame and	♦ Overview	1	2	3

S. N.	TASK	RELATED KNOWLEDGE	THEORY	PRAC.	TOTAL
	frameset				
6.	Create hyperlinks with text and image ♦ Hyperlinks ♦ Text and image	Introduction and types of hyperlink	1	2	3
7	Style sheet ♦ Create and Implement CSS	♦ Concept of CSS ♦ Method of using CSS in html	2	3	5
8	Use AJAX	♦ Introduction to AJAX and JQUERY	2	1	3
9.	Project Work			6	6
	Sub-Total		**10**	**25**	**35**

4.2: Work in Dreamweaver Program

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			THEORY	PRAC.	TOTAL
1.	Familiarize with Dreamweaver Interface ♦ Select a workspace ♦ Use document window & toolbars ♦ Use launcher ♦ Use insert panel & tool sets ♦ Use document toolbar ♦ Use property inspector ♦ Use dockable floating panels ♦ Use contextual menus	♦ Introduction to Dreamweaver and workspace ♦ Introduction to launcher and toolbars	2	5	7
2.	Manage Site ♦ Define site ♦ Manage file and folder ♦ Create site maps ♦ Use the file browser ♦ Create a site from nothing	♦ Introduction to site	1	3	4
3.	Edit Webpage ♦ Create and save documents ♦ Insert images with assets panel ♦ Add text ♦ Align page elements ♦ Modify page properties ♦ Create links with text and images ♦ Add keyword & description meta tags ♦ Preview in browser ♦ Format html text ♦ Use font lists	**Webpage** Introduction to webpage	1	5	6

S. N.	TASK	RELATED KNOWLEDGE	THEORY	PRAC.	TOTAL
	♦ Align text ♦ Use html lists ♦ Use color schemes ♦ Use text in tables				
4.	Insert links ♦ link with point to file ♦ link to new source files ♦ browse for file and link history ♦ Insert anchor links ♦ Insert email links ♦ Insert file links ♦ Map Image	♦ Introduction and types of link ♦ Concept of anchor	1	4	5
5.	Insert tables and Flash objects ♦ Insert and modify a table ♦ Create fix width tables ♦ Create relative width tables ♦ Create hybrid table ♦ Insert tabular data ♦ Sort table data ♦ Insert Flash object and sound	Concept of table and objects	1	4	5
6.	Create Forms ♦ Insert form objects ♦ Create a form ♦ Create a jump menu	Concept of forms	1	4	5
7	Use Codes ♦ Edit in the code view ♦ Use code view options ♦ Use quick tag editor & attribute hints ♦ clean-up HTML ♦ clean-up word HTML ♦ Use code validator / XHTML	Importance of code view Introduction of XHTML	1	5	6
8.	Project Work			7	7
Sub-Total			**8**	**37**	**45**

4.3: Work in PHP (Hypertext Preprocessor)

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			THEORY	PRAC.	TOTAL
1.	PHP fundamentals ♦ Set server environment ♦ Install XAMPP ♦ Run PHP Scripts ♦ Format Outputs ♦ Work with Variables,	♦ Introduction to Scripting, Client Side scripting ♦ Introduction to PHP ♦ Concatenation ♦ Operators and its types ♦ Conditional Statements, Iteration	5	8	13

	Global Variables and Constants ♦ Code with Concatenation, mathematical and relational operators ♦ Work with Conditional Statements, Iteration ♦ Use Built-In and user-defined functions ♦ Work on Numeric, associative and multi-dimensional array ♦ Use GET/POST methods	♦ Looping ♦ Code Escape Sequences			
2.	Access Mysql database ♦ Explore phpMyAdmin panel ♦ Create database, tables ♦ Establish Connection to Mysql from PHP ♦ Insert, Select, Update and Delete Records ♦ Operator like "Between", "Like" and "In" ♦ Perform SQL Join(Inner Join, Outer Join)	♦ Introduction to phpMyAdmin ♦ Introduction to Database ♦ Introduction to SQL and Type of Join	4	7	11
3.	Manage Session and Cookie ♦ Work on Password encryption and decryption, Emailing links to change Password ♦ Manage Session ♦ Preventing unauthorized access ♦ Work on Session destroy function ♦ Manage Cookie	♦ Introduction to Session and Cookie with its usage	5	7	12
4.	Integrate jQuery and AJAX ♦ Integrating jQuery Slider, rotater ♦ Use jQuery Tabs and accordion. ♦ Use Dynamic jQuery	♦ Concept of AJAX and jQuery	4	5	9

	Slider ♦ Use Advanced jQuery effects ♦ Use XML Http Request Object ♦ Fetch data asynchronously from database				
5.	Project Work & Presentation			10	10
Sub-Total			**18**	**37**	**55**

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- Felke-Morris, T. (2013). Web development and design foundations with HTML5 (6thed). New Delhi : Pearson.
- Robson, E., & Freeman, E. (2012). *Head first HTML and CSS* (2nd ed). Sebastopol, CA: O'Reilly.
- MacCaw, A. (2011). Java Script web applications: Alex MacCaw. O'Reilly.

Database Management System

Total: 234 hours

Theory: 62 hours

Practical: 172 hours

Course Description:
This course is designed to provide basic knowledge in database management system. It intends to provide knowledge and skills on Access & SQL program. The trainee will be introduced to the different application related to the database management system.

Course Objectives:
At the end of this course students will be able to:
- Familiar with database management system.
- Create & design database table & form.
- Perform data query.
- Prepare report.

Module 1: Familiarize with Database Management System.

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			THEORY	PRAC.	TOTAL
1.	Familiarize with Database Systems	♦ Differences between data and information. ♦ Types of databases and their value for decision making. ♦ Importance of database design. ♦ Database roots in file systems. ♦ Problems with file system data management. ♦ Differences between databases and file systems	3		
2	Familiarize with Data Model	♦ The importance of data models. ♦ The basic building blocks of data models. ♦ The relationship between data models and business rules. ♦ The evolution of data models. ♦ Classifications of data models by degree of	5		

		abstraction			
3	Conceptualize Design using the Relational Database Model (RDBMS)	♦ A Logical View of Data. ♦ Keys. ♦ Integrity Rules. ♦ Relational Set Operators. ♦ The Data Dictionary and the System Catalog. ♦ Relationships within the Relational Database. ♦ Data Redundancy Revisited. ♦ Indexes.	6		
4	Conceptualize Design using the Entity Relationship (ER) Modeling	♦ The Entity Relationship (ER) model (entities, attributes, relationships, connectivity and cardinality, existence dependence, relationship strength, weak entities, relationship participation, relationship degree, recursive relationships, composite entities) ♦ Developing an ER Diagram. ♦ Database Design Challenges: Conflicting Goals.	6		
5	Design Normalization of Database Tables	♦ Database Tables and Normalization. ♦ The Need for Normalization. ♦ The Normalization Process (1NF, 2NF, 3NF). ♦ Improving the Design. ♦ Surrogate Key Considerations. ♦ Higher-Level Normal Forms. ♦ Normalization and Database Design. ♦ DE normalization.	5		
Sub-Total			**25**		**25**

Module 2: Work in MS Access Program.

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			T	P	TOTAL
1.	• Start MS Access • Open database and save it. • Create table in design view, wizard, datasheet view. • Exit Data base.	• The importance of Access and use of an electronic database. • Data, information, database, field, record, table. • Running MS Access. • Opening the existing data. • Creating the blank database. • Creating tables in design view. • Choosing the proper field properties for the suitable data like text, number, date and time, currency, look up wizard.	1	4	5
2	• Move the field order. • Customize data to be entered. • Apply validation rule. • Use primary key field in the data table.	• Arranging lines in proper order. • Limit the data input in a field. • Identify the function of validation rules, validation text, and caption, indexed. • Mention the use of Primary Key (P.K.) • Differentiating the flat database and relational database.	2	8	10
3	• Fill the tables with data. • Edit data • Delete data • Add database to the favorite. • Create relationship. • Enforce data integrity rule. • Use (PK) and (FK) in the relation.	• Entering data in the table. • Adding database to the desired favorites. • Establishing relationship between the tables. • Applying referential Integrity • Using the (PK) and (FK) • Distinguishing one to one, one to many and many to many relationships.	2	10	12
4	• Use different formula by using query in table and calculate. • Create query in design view. • Switch between runtime and design view.	• Give the introduction of the objects used in MS Access like forms, query, and reports. • Using various types of queries. • Calculating the fields using update query.	2	10	12

	• Create APPEND, SELECT, MAKE TABLE, DELETE query. • Switch between runtime and design view.	• Creating query in design view and by using wizard. • Changing between the views.			
5	• Insert query parameters to retrieve the data of the table. • Use joins types to show the data.	• Setting the parameters. • Passing the parameters to fill the fields. • Using the join types. (Inner joins, left join and right join)	1	7	8
6	• Create form using wizard. • Create forms in design view. • Insert input fields & resources. • Insert images. • Place the link (data link) • Format the form & resources.	• Mentioning the use of forms & Sub forms. • Creating the different styles of forms using wizard. • Inserting the images. • Connecting table with the form. • Using the naming convention of buttons, text box, list box. • Elements of forms (Textbox, Label, Button, Tab Control, Combo Box, List Box, Check Box, Attachment, Option Group)	2	8	10
7	• Customize the form. • Link query in form. • Create text box control • Create Macros & assign task to it. • Use VB code. • Use nested if for complex decision. • Create simple calculator using VB.	• Mentioning the form properties and select the required properties for the form. • Linking query in the form. • Mentioning the use of Macros. • Creating useful macros. • Using VB for decision. • Using nested if • Using text box control.	1	8	9
8	• Insert check box. • Insert radio buttons. • Use DO command. • Create splash screen. • Create link between tables and forms. • Display message box.	• Using check box control on the form. • Using radio buttons on the form. • Using do command. • Displaying message box. • Creating log on dialogue box. • Creating splash screen.	2	7	9
9	• Create report by wizard. • Use SQL to create table	• Knowledge on the function of the reports.	2	8	10

	and to run query. • Enter in SQL. • Show the report in print preview and design view. • Customize the report. • Create table. • Select table. • Order the data (sorting). • Update the data of table (calculate). • Link the filed using AS, FROM.	• Opening a report using the conditional macros. • Mentioning the use of SQL (Structured Query language) • Using CREATE, SELECT, AS, FROM, ORDER BY, WHERE in SQL.			
10	• Back-up Database	Backup database • Introduction • Type • Importance • Process	1	2	3
11	Project Work			5	5
Sub-Total			**16**	**77**	**93**

Module 3: Perform in Structured Query Language (SQL) Program.

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			T	P	TOTAL
1.	Familiarize with Structured Query Language (SQL)	➤ Relational Query Languages ➤ Introduction ➤ Type ➤ Function ➤ Importance ♦ Semantics of a Query ♦ The SQL Query Language ♦ History of SQL ♦ Types and versions of SQL	4		4
2	Design using the Structure SQL	♦ DDL and DML ➤ Introduction ➤ Type ➤ Function ➤ Importance ♦ Reserved words and reserved characters ♦ Capital and small characters in SQL	4	2	6
3	Manage Tables ♦ Create table ♦ Drop table ♦ Alter table ♦ Truncate table	♦ Data and data types ♦ Numerical data types ♦ String data types ♦ Null Values ♦ Concept of tables	2	12	14

	◆ Assign Primary key and foreign key				
4	Edit Data Records ◆ Insert ◆ Update ◆ Delete	◆ Concept of data editing	2	8	10
5	Obtain reference Data ◆ SELECT command ◆ Obtain Conditional reference data using WHERE ◆ Join tables ◆ Query multiple relations ◆ Group by ◆ Order by ◆ Sub query UNION	◆ Concept of referencing data ◆ Syntax, operators and it's types ◆ Conditional clauses	2	14	16
6	Familiarize with Operators ◆ Apply Arithmetic operators ◆ Apply Comparison operators ◆ Apply Logical operators	**Operators** ➢ Introduction ➢ Function ➢ Importance ➢ Type ◆ Arithmetic operators (+, -, *, /, %) ◆ Comparison operators (=, >, <, >=, <=, <>, !=) ◆ Logical operators (ALL, AND, ANY, BETWEEN, EXISTS, IN, LIKE, NOT, OR, SOME)	2	16	18
7	Manage views ◆ Create view ◆ Drop view	◆ Introduction of views	1	8	9
8	Perform Transaction ◆ Dead lock problem ◆ Begin transaction ◆ Commit transaction ◆ Rollback transaction Save point	**Transaction** ➢ Introduction ➢ Type ➢ Function ➢ Importance	2	15	17
9	Familiarize with Functions ◆ Apply Arithmetic functions (AVG, COUNT, MAX, MIN, SUM) ◆ Apply String functions (LTRIM, RTRIM, TRIM)	Introduction and types of function	2	15	17
10	Project Work			5	5
Sub-Total			**21**	**95**	**116**

References:

- Ramakrishnan, R. & Gehrke, J. (2003). Database management systems (3rd ed). Boston: McGraw-Hill.
- Silberschatz, A. (2011). Database system concepts (6th ed). New York: McGraw-Hill.
- Forta, B. (2013). Sams teach yourself SQL in 10 minutes (Fourth edition). Indianapolis, Indiana: Sams.
- Hoffer, J. A., Prescott, M. B., & McFadden, F. R. (2005). Modern database management (7th ed). Upper Saddle River, N.J: Pearson/ Prentice Hall.

Computer Programming

Total: 234 hours
Theory: 48 hours
Practical: 186 hours

Course Description:
This course is designed to provide basic knowledge in computer programming language. It intends to provide basic knowledge and skills to computer programmer. The trainee will be introduced to the computer programming languages.

Course Objectives:
At the end of this course students will be able to:
- know the basic concept of programming and logics
- understands the procedures programming language with the reference of C program
- generate the simple program with implementation of programming techniques
- understand the 4GL programming concept
- enable to develop the application to solve the business problems

Module 1: Programing in C

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			T	P	TOTAL
2	Familiarize with programming Concept and Create programming logics ♦ Write Algorithm ♦ Draw flow chart	♦ Programming Concept and create programming logics ♦ Concept of Flow Chart ♦ Symbols of flow chart ♦ Algorithm ♦ Pseudo code	3	3	6
2	Understand the C Editors and IDEs ♦ Install C programming in Window Environment ♦ Write a first program - Hello world ♦ Make and save programs ♦ Pass command line arguments to your program ♦ Write comments ♦ Include Header files	♦ Introduction of C ♦ Different Version of C Editors (Turbo, Borland, Code lite) ♦ Concept of interpreter, compiler, and assembler ♦ Arguments and return values ♦ Passing command line arguments to your program ♦ Comments ♦ Header Files	3	6	9
3.	Implement the Variables, constants and types	♦ Variables and data types ♦ Constants ♦ Naming conventions ♦ Keywords	1	4	5
4.	Apply operator in a program	**Types of operators** ♦ Arithmetic operators	3	10	13

S.N.	TASK	RELATED KNOWLEDGE	T	P	TOTAL
		◆ assignment increment and decrement operators ◆ Logical operators ◆ Relational operator ◆ Bitwise operator			
5.	Apply control statement and loop in a program	**Control statement & looping** ◆ If-else statement ◆ Switch-case statement ◆ Loop Statement (For, While, do while) ◆ Continue and break statement	2	15	17
6.	Apply array in a program	◆ Initializing arrays ◆ Loop in Array ◆ One and two dimensional arrays	4	3	7
7.	Declare, define and implement the functions in a program	◆ Introduction to Function ◆ Declaration of Function ◆ Return Type and Argument passing in Array	3	10	13
8.	Define String function	◆ String in C ◆ String Function	2	3	5
9.	Define pointer	◆ Introduction of Pointer ◆ Pointer and Array ◆ Pointer and Function	2	3	5
10.	Define structures	◆ Introduction of Structure ◆ Structure & Pointer	2	3	5
11.	Handle file	◆ Opening and closing files ◆ File modes ◆ Reading and writing a text file	2	7	9
12.	Initialize graphics concept	◆ Introduction to graphics ◆ Simple Graphics Function	1	5	6
13.	Project work			15	15
Sub-Total			**28**	**87**	**115**

Module 2: Visual Program (Visual Basic.net)

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			T	P	TOTAL
1.	Familiarize with Visual Programming	◆ Visual Programming Concept ◆ Concept of .NET Framework	2	1	3
2.	Set Up Visual Programming and Playing with Visual Basic IDE	◆ Installation of Visual Basic .net ◆ Types of project in .NET	2	2	4

		♦ IDE of VB.NET: Menu bar, Toolbar, Solution Explorer, Toolbox properties, From Designer, Output Window, Object Browser. ♦ Environment: Editor Tab, Format Tab, General Tab, Docking tab, ♦ Methods and Events			
3.	Apply Variables, Constants and Data Types in Visual Programming	♦ Variables and Data Types ♦ Variable Declaration, Scope and Life time ♦ Constants	2	4	6
	Apply String and Array in visual programming	♦ Concept of Array ♦ String Handling in VB	2	4	6
	Create a Control Structure and its Operators in Visual Programming	♦ If/Then Selection Structure ♦ If/Then/Else Selection Structure ♦ While Repetition Structure ♦ DoWhile/Loop Repetition Structure ♦ DoUntil/Loop Repetition Structure ♦ Do/LoopWhile Repetition Structure ♦ Do/LoopUntil Repetition Structure ♦ Assignment Operators ♦ For/Next Repetition Structure ♦ Select Case Multiple-Selection Structure ♦ Using the Exit Keyword in a Repetition Structure ♦ Logical Operators	2	20	22
	Apply Function and Sub with return types and arguments	♦ Sub and Function ♦ Function: Passing variable Number of Arguments, Returning value from the function	3	6	9
4.	Work with form with its properties Work with Major Toolbox object with properties	♦ Control of Form ♦ Windows form: Textbox, Label, Button, List Box, Combo Box, Check Box,	1	15	16

		Picture Box, Radio Button, Scroll Bar, Timer, List View, Toolbar, Status bar and Properties ♦ Dialog. Open File Dilog, Save File Dilog, Font Dilog, Color Dilog, Print Dialog ♦ Designing Menu: Context Menu, access And shortcut Key			
5.	Create a Class and Object using visual basic object, components Create .dll file as components	♦ Classes and Objects ♦ Access Specifiers ♦ Overviews of OLE ♦ Accessing the WIN32 API from .NET and Interfacing ♦ COM Technology ♦ Create User Control ♦ Register User Control. ♦ Access COM components in .NET application	2	10	12
6	Apply Exception Handling concept using try and catch statement	♦ Concept of Exception Handling ♦ Try ♦ Catch	1	4	5
7	Create Database Connection using ADO.net Apply SQLDB and OLEDB Apply Data Adapter, Command and Reader in ADO ,Net	♦ Overviews of ADO .NET ♦ Accessing Data using Server Explorer ♦ Creating Connection, Command, Data adapter and Data Set With OLEDB and SQLDB ♦ Display Data on Data bound controls, display data ♦ Concept of report	3	18	21
7	Develop Small application with form, data connection, control form and reports as Project Work			15	
Sub-Total			**20**	**99**	**119**

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- Byron S Gottfried "Programming with C" Second edition, Tata McGraw hill, 2007.
- Kanetkar Y, "Let us C", BPB Publications, 2007.
- Hanly J R & Koffman E.B, "Problem Solving and Programm design in C", Pearson Education, 2009.
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Computer Hardware &Networking

Total: 234 hours

Theory: 44 hours

Practical: 190 hours

Course Description:
This course is designed to provide the basic knowledge in computer hardware and networking. It intends to provide basic knowledge and skills on computer hardware and networking. The trainee will be introduced to the computer hardware and networking system.

Course Objectives:
At the end of this course students will be able to:
- Assemble Computer Hardware.
- Repair/replace Computer components.
- Establish Computer Networking.
- Configure Internet connection.
- Share resources on networking.
- Repair/replace computer networking components.

Module 1: Assemble & repair Computer Hardware

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			THEORY	PRAC.	TOTAL
1.	Introduction to Computer Systems	♦ Computer History, *Generation,* Evolution and types ♦ Computer function procedure	1		1
2.	Familiarize with Classification of Computers	♦ Technology, Uses and Capacity of computer	1	1	2
3.	Identify the computer components: ♦ Input devices (Keyboard, Mouse, Microphone, Camera, scanner) ♦ Output devices (Display, Speaker, printer) ♦ Processor ♦ Motherboard ♦ Memory& its slot ♦ Data cable and power cable ♦ Casing ♦ Power supply ♦ PCI Devices	♦ Hardware ♦ Software ♦ Utilities ♦ Application Software ♦ Programming Language ♦ Input devices (Keyboard, Mouse, Microphone, Camera, scanner) ♦ Output devices (Display, Speaker, printer) ♦ Processor ♦ Motherboard ♦ Memory& its slot ♦ Data cable and power cable ♦ Setting of computer ♦ Computer room protection ♦ Casing	3	15	18

	♦ Storage devices (HDD,Optical disk, Flash Disk ♦ Slots & ports	♦ Power supply ♦ PCI Devices ♦ Storage devices (HDD,Optical disk, Flash Disk)			
4.	Familiarize with Printer ♦ Identify Printer components ♦ Install printer driver ♦ Replace tonner/cartridge ♦ Connect printer ♦ Troubleshoot Printer	♦ Basic Operation & Installation of Printer ♦ Types of Printer ♦ Resolution ♦ Port/slot	1	4	5
5.	Familiarize with Scanner ♦ Identify Scanner component ♦ Connect scanner ♦ Install scanner device ♦ Operate scanner	♦ Basic Operation of Scanner ♦ Types of Scanner ♦ Resolution ♦ Port/slot	1	2	3
6.	Familiarize with Power Backup System ♦ Install UPS	Power backup sysem ♦ Importance ♦ Types ♦ Maintenance	1	1	2
7	Assemble computer ♦ Assemble Casing ♦ Mount motherboard ♦ Install RAM ♦ Install Hard Disk ♦ Install cards ♦ Install processor with heat sink ♦ Install SMPS ♦ Install optical drive ♦ Connect interfaces ♦ Connect Display ♦ Connect keyboard ♦ Connect mouse	Introduction, Types, function & specification of: ♦ Casing, motherboard, RAM, hard Disk, processor, optical drive, cards, Slots/ports, display and input units	2	20	22
8.	Operate MS-DOS ♦ Create/Save/Copy/Move/Delete files ♦ Make/Change/Remove directory ♦ Format disks ♦ Change attributes ♦ Create/use BAT file	♦ Introduction of MS-DOS ♦ Running and closing DOS ♦ External and Internal Command ♦ Getting help about commands ♦ Changing current directory, getting list of files	1	8	9
9.	Install Operating system	♦ System requirements ♦ Installation process of Operating Software	2	10	12

		♦ Driver Installation ♦ Application Software ♦ File system ♦ Process of partition.			
10.	Install Utilities Software	♦ Virus scanning ♦ Disk Compression ♦ Disk defragmentation and scandisk	1	3	4
11.	Install Application Software	Installation process of application software	1	3	4
12.	Install Device driver	Installation/un-installation process of device driver	1	2	3
13.	Operate multimedia (projector, digital camera, audio-video)	♦ Component of Multimedia ♦ Application of Multimedia	1	4	5
14.	Familiarize with Computer Security • Setup Firewall • Install antivirus • Create/delete password on computer	• Concept of Firewall (Enabling/Disabling) and its usages • Concept of Virus -Malware, Worms, Trojan, Spyware, Adware • Concept of different Security Threats • Concept of Data Security • Introduction to Personal & General Security of Personal Computer • Ideas of Password Protection to Personal Computer • Internet Browser Security & Web Security	1	2	3
15.	Troubleshoot computer system faults • Run System tools • Repair/replace computer hardware components.	♦ Types of faults in computer system: software, display faults, storage fault ♦ Process of finding computer system faults. ♦ Computer hardware specification. ♦ System compatibility.	2	10	12
16.	**Project Work**			10	10
Sub-Total			**20**	**95**	**115**

Module 2: Perform Computer Networking

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			THEORY	PRAC.	TOTAL
1.	Familiarize with Computer Networking	• Computer network • Introduction • Types (LAN/ MAN/ WAN) • Function • Importance • Advantage/Disadvantage • Network architecture	1	1	2
2.	Familiarize with Topology and transmission media	• Topology (point-to-point, star, bus, ring) • Transmission speed • Transmission medium. Cable (twisted pair cable, coaxial cable, optical fiber cable), wireless (infrared rays, radio wave, laser) • Transmission system (base band, broad band)	3	2	5

3.	Familiarize with OSI reference model	• Reference model
		  • Introduction
		  • Types
		  • Function
		• Layers of OSI reference model /7 Layers (Application layer, Presentation layer, Session layer, Transport layer, Network layer, Data link layer, Physical layer)
			2	2	4

4	Familiarize with Network Protocols
	• Assign IP address
		• Introduction and function of
		  ➢ IPX/SPX
		  ➢ Apple Talk
		  ➢ Net BIOS and Net BEUI
		  ➢ TCP/IP
		• Relationship between Ethernet and TCP/IP
		• IP address
		  • Introduction
		  • Types (class A, B, C, D, E)
		• Subnet mask
			4	2	6

		• Global address and private address • Broad cast address • Multi cast address • TCP and UDP • IPv4 and IPv6 • ICMP • ARP and RARP, MAC address • Major network commands of TCP/IP (Ping, IP Configuration, etc)			

5.	Install & configure
	• NIC
	• Modem
	• Repeater
	• HUB and Switching HUB
	• Bridge
	• Router
		• Introduction and function of
		  • NIC
		  • Modem
		  • Repeater
		  • HUB and Switching HUB. Cascade connecting.
		  • Bridge
		  • Router
			2	10	12

6.	Perform Network Wiring • Mark cable route & components. • Lay cable. • Install PVC conduit pipe/PVC batten. • Install junction Box • Install Jack Socket.	Network wiring • Layout diagram • Wiring technique • Marking technique • Cable types & size • Size & uses of junction box. • Introduction, size & uses of different jacks/sockets.	1	15	16
7.	Connect Network cables • Connect RJ45 Jack • Connect RJ45 Socket.	• Cable types & size • Jacks & Connector • Clamper • Connection tester • Multimeter • Soldering process	1	5	6
8.	Configure windows networking services • Share file/folder/drive • Share printer/scanner • Share Internet • Search computer on network.	• Sharing Options. • Permission.	1	10	11

	• Assign workgroup • Assign computer name.				
9.	Configure server applications services	♦ File server (FTP, file sharing) ♦ Printer server (Printer sharing, etc) ♦ Web server (WWW etc) ♦ Mail server (POP, SMTP ♦ Telnet server ♦ DHCP server ♦ DNS server and Windows DNS server. ♦ SNMP server ♦ Proxy server	2	2	4
10.	Provide OS networking services	♦ Windows NT, 2000 Server, 2003 Server ♦ Unix ♦ Linux ♦ Others (Net BSD, NetWare, etc)	1	1	2
11.	Configure printing system in networking services • Install Printer Server	♦ Network Printer ♦ Printer server ♦ Permission	1	5	6
12.	Configure: ♦ FDDI ♦ Wireless LAN ♦ ATM-LAN ♦ Token-Ring ♦ Token Bus	♦ FDDI ♦ Wireless LAN ♦ ATM-LAN ♦ Token-Ring ♦ Token-Bus	2	15	17
13.	Manage networking security services	♦ Installation, Set-up & Update of Antivirus, AntiSpyware, AntiMalwareetc ♦ Set Up & Usage of Windows Firewall ♦ Introduction of ftps://, https:// and other security measures	1	5	6
14.	Repair Network devices	♦ Component of Dialup (Modem, PSTN line,ADSL& Cable) ♦ Component of LAN ♦ Other network devices ♦ Concept of Bandwidth	2	10	12
	Project Work			10	10
Sub Total			**24**	**95**	**119**

References:

- Computer Operator Google, Author by Er. Suvash Chandra Gautama
- Easy Computer Operator, Author by Binod Singh Yadav
- Highway of Advanced Computer Operator, Author by Gunaraj Bhandari/ Kamal Prasad Dhungel
- Computer Network, Author by Andrew S. Tanenbaum
- Craig Hunt "TCP/IP Network Administration", fourth Edition
- Roy Blake "Wireless Communication Technology" Delmar Thomson Learning
- Mark Minasi "The Complete PC upgrade and Maintenance Guide" fifth Edition –BPB publication
- Vikas Gupta "Comdex Hardware & Networking Course Kit" Published by dreamtech press
- Tanenbaum, A. S., & Wetherall, D. (2011). Computer networks (5th ed). Boston: Pearson Prentice Hall.
- Rosch, W. L. (2003). Winn L. Rosch hardware bible. [Indianapolis, IN]: Que Pub.
- Mueller, S. (2015). *Upgrading and repairing PCs*.

System Analysis & Design

Total: 78 hours

Theory: 32 hours

Practical: 46 hours

Course Description:
This course is designed to provide the basic knowledge in computer system analysis and design. The student will be introduced to the computer system analysis and design.

Course Objectives:
At the end of this course students will be able to:
- Overview of system analysis/design concepts
- Manage and analysis/design activities
- Collect data
- Analyse/Process data
- Design essential components
- Control quality of system
- Perform project work

Overview system analysis/design concepts

S. N.	TASKS	RELATED KNOWLEDGE	TIME (IN HOURS)		TOTAL
			THEORY	PRAC.	
1.	Understand Data processing system	◆ Data processing system ➢ Definition ➢ Function ➢ Importance	1		1
2.	Explain Management Information System	◆ Management information system ➢ Definition ➢ Function ➢ Importance	½		½
3.	Describe Data support system	◆ Decision support systems ➢ Definition ➢ Function ➢ Importance	½		½
4.	Understand artificial intelligence	◆ Artificial intelligence ➢ Definition ➢ Function ➢ Importance	½		½
5.	Identify system analysis and design	◆ System analysis/design identify ➢ Definition ➢ Function ➢ Importance	½		½
6.	Familiarize with system development and flow	◆ System analysis ◆ System design ◆ Program design	1	2	3

S. N.	TASKS	RELATED KNOWLEDGE	THEORY	PRAC.	TOTAL
		◆ Programming ◆ Program test ◆ System test ◆ Running test			
7.	Prepare major system development models	◆ Water fall model ◆ Spiral model ◆ Others	1	1	2
Sub-Total			**5**	**3**	**8**

Module 2: Manage Analysis/Design activities

S. N.	TASKS	RELATED KNOWLEDGE	TIME (IN HOURS)		TOTAL
			THEORY	PRAC.	
1.	Identify problem	◆ Project initiation, Specific sign of problem	½	1	1½
2.	Identify opportunity for improvement	◆ Possibilities for improvement, criteria for selection of system projects	½	1	1½
3.	Determine feasibility	◆ Objectives, Resources ◆ Types of feasibility; Technical, Economical, Operational ◆ Making judgement on feasibility	1	1	2
4.	Plan / Control activities	◆ Time estimation, Gantt charts, CPM and PERT	1	1	2
5.	Manage analysis / design activities	◆ Communication strategies for team management, ◆ Productivity goal, motivation ◆ Project failures	1	1	2
Sub-Total			**4**	**5**	**9**

Module 3: Collect data

S.No.	TASKS	RELATED KNOWLEDGE	TIME (IN HOURS)		TOTAL
			THEORY	PRAC.	
1.	Design sample	◆ Need of sampling ◆ Types of sampling; Convenience, Purposive, Random ◆ Sample size.	1	1	2
2.	Conduct interview	◆ Planning interview, Objectives of interview ◆ Types of question; Close & Open ended, Probe ◆ Question pitfalls	1	1	2
3.	Administer questionnaires	◆ Planning questionnaire administration ◆ Scales in questionnaire	1	1	2

S.No	TASKS	RELATED KNOWLEDGE	TIME (IN HOURS)		TOTAL
		♦ Validity, Reliability ♦ Clustering of questions of similar content			
4.	Observe decision making activity	♦ Time event sampling, body language of decision maker	1	1	2
5.	Observe office environment	♦ Filmic & Organisational elements, STROBE (*STR*uctured *O*bservation of the *E*nvironment)	1	1	2
6.	Develop prototype / model	♦ Types of Prototypes; Patched up, Non-operational, First -of-a-series, Selected featured ♦ Guidelines for developing a prototypes ♦ Modifications on user's interface ♦ Advantage and disadvantage of prototypes	2	2	4
Sub-Total			**7**	**7**	**14**

Module 4: Analyze /Process data

S.No.	TASKS	RELATED KNOWLEDGE	TIME (IN HOURS)		TOTAL
			THEORY	PRAC.	
1.	Develop data flow diagram	♦ Basic symbols of data flow, conventions ♦ Context diagram ♦ Approaches in data flow diagram ♦ Labelling	1	2	3
2.	Develop data dictionary	♦ Data in data dictionary, ♦ Cataloguing, ♦ Data processes, data flow, data store, data structure, data elements ♦ Steps in compiling data dictionaries	1	2	3
3.	Analyze structured decision system	♦ Information required for structured decision, ♦ Structured English ♦ Decision table and trees ♦ Completeness and accuracy	1	2	3

4.	Analyze semi-structured decision system	♦ Risk in decision making, ♦ Types of decision; Analytic, Heuristic and Intelligence ♦ Design and choice ♦ Multiple criteria for decision making; Trade-off, Weighting, Sequential elimination and Goal programming	2	2	4
5.	Prepare/Present system proposal	♦ Inventorying and evaluation of computer hardware ♦ Workload estimation ♦ Acquisition of computer equipment, Vendor support ♦ Software evaluation ♦ Benefit/Cost , Payback, Cash flow analysis, trends ♦ Organising system proposal and its content	2	4	6
Sub-Total			**7**	**12**	**19**

Module 5: Design essential components

S. N.	TASKS	RELATED KNOWLEDGE	TIME (IN HOURS)		TOTAL
			THEORY	PRAC.	
1.	Design output	♦ Objectives of effective output ♦ Output technology ♦ Avoiding biases ♦ Functional and stylistic/Aesthetic attributes	1	2	3
2.	Design input	♦ Guidelines for form design, ♦ Screen design; Icons and Colours	1	1	2
3.	Design file/database	♦ Conventional files and databases ♦ Data concepts ♦ File and database organisation ♦ Normalisation	1	1	2
4.	Design user interface	♦ Types of user interface; Natural language, Question-and-Answer, Menus, input/output, Command language,	1	2	3

S. N.	TASKS	RELATED KNOWLEDGE	TIME (IN HOURS)		TOTAL
			THEORY	PRAC.	
		Direct manipulation and the Mouse			
5.	Design data entry procedures	♦ Objectives ♦ Purpose of coding ♦ Effective/Accurate coding ♦ Bottleneck in data entry	1	2	3
6.	Deploy project	♦ Implementation approaches	1	2	3
Sub-Total			6	10	16

Module 6: Control quality of system

S. N.	TASKS	RELATED KNOWLEDGE	TIME (IN HOURS)		TOTAL
			THEORY	PRAC.	
1		Explain total quality assurance approach ♦ Quality assurance approaches, Structured walkthrough ♦ Bottom-up and Top-down design	1	0	1
2	Experiment system	♦ Testing processes ♦ White Box and Black Box test ♦ Bottom-up and Top-down test	1	1	2
3	Maintain system	♦ Maintenance practices	½	1	1½
4	Audit system	♦ Internal/External auditing	½	1	1½
Sub-Total			3	3	6

Module 7: Perform Project work

S. N.	TASKS	RELATED KNOWLEDGE	TIME (IN HOURS)		TOTAL
			THEORY	PRAC.	
1	Perform project work			5	5
Sub-Total				5	5

References:
- Jeffrey A. Hoffer, Joey F. George, Joseph S, Valacich "Modern systems Analysis and Design", Pearson Education, second Edition.
- Englewood cliffs, New Jersey, 2nd edition, "Systems analysis and Design"
- Baase, Pearson Education, "Computer Algorithms: Introduction to Design and Analysis"
- Whitten, J. L., & Bentley, L. D. (2007). Systems analysis and design methods (7th ed). Boston: McGraw-Hill/Irwin.
- Rajaraman, V. (2004). *Analysis and design of information systems*. New Delhi: Prentice-Hall of India.
- Booch, G. (1994). Object-oriented analysis and design with applications (2nd ed). Redwood City, Calif: Benjamin/Cummings Pub. Co.

Communicative Skills

Total: 78 hours

Theory: 23 hours

Practical: 55 hours

Course Description:

This course includes basic knowledge and skills related to communication required for the occupation. The trainees will also acquire verbal and written communication skills including proposal and report writing.

Course Objectives:

At the end of this course students will be able to:

- be familiarize with basics of communication systems
- organize interview, meeting and conferences
- apply written communication skills including letters, memo and report writing

Module 1: Follow Basics of Communication System

S. N.	TASKS	RELATED KNOWLEDGE	TIME (IN HOUR)		
			THEORY	PRACT.	TOTAL
1.	Familiarize with Communication	♦ Communication ➤ Introduction ➤ Types ➤ Functions ➤ Importance ♦ Communicating directives, instructions and policies ♦ Communication medias ➤ Telephone, ➤ Face-to-face, ➤ Written or ➤ Visual ➤ Internet ♦ Flow of ideas, suggestions and queries	2	2	4
3	Perform internal communication	♦ Introduction ♦ Importance ♦ means of communication ♦ process	1	2	3

4	Perform external communication	◆ Introduction ◆ Importance ◆ means of communication ◆ process	1	2	3
Sub-Total			**4**	**6**	**10**

Module 2: Organize Interviews, Meetings and Conferences

S. N.	TASKS	RELATED KNOWLEDGE	TIME (HOUR)		
			THEORY	PRACT.	TOTAL
1	Arrange interview	◆ Techniques of oral communication ◆ Non-verbal cues or body language ◆ Logistics and conducive environment required for interview situation	2	4	6
2	Prepare meeting	◆ Contents and format of a chairperson's agenda ◆ Contents and format of a meeting preparation sheet ◆ Requisitions of a meeting place	1	3	4
3	Prepare/circulate agenda	◆ Format and components of a standard agenda of the meeting ◆ Contents of a mailing list	1	1	2
5	Arrange meeting	◆ Requirements of a meeting ◆ Sitting arrangements ◆ Logistic arrangement	1	2	3
6	Conduct meeting	◆ Meeting tools, Equipments and material ◆ Opinions/ discussions and real decisions	1	5	6
7	Write minutes	◆ Introduction ◆ Importance ◆ criteria/components ◆ writing process	1	4	5
8	Plan for Conference	◆ Nature and activities of a conference	1	2	3
9.	Finalize Arrangements for the Conference	◆ Conference details, and related activities and requirement	1	2	3
10.	Host the Conference	◆ Etiquette of dealing with hosts	1	4	5
Sub-Total			**10**	**27**	**37**

Module 3: Written Communication Including Letters, Memos and Reports

S. N.	TASKS	RELATED KNOWLEDGE	TIME (HOURS)		
			THEORY	PRACT.	TOTAL
1.	Set basic guidelines for good letter	♦ Letter ♦ Definition ♦ Types ♦ Function ♦ Importance ♦ Letter writing style and its layout	1	2	3
2.	Plan letter	♦ Right order to a letter ♦ Spider diagram and correct language	1	2	3

3.	Compose letter	♦ Format and components
		♦ Layout of a letter
		♦ Latter structure
		♦ Differences in:
		  ➢ Blocked,
		  ➢ Semi-blocked and
		  ➢ Full-blocked style
		♦ Open and closed punctuation system
			2	7	9

5.	Write memoranda	♦ Format and components of memoranda	1	3	4
6.	Preplan / Perform groundwork for report writing	♦ Format and components of a report ♦ Types of report ♦ Regular/routine ♦ Occasional ♦ Especially commissioned ♦ Schematic investigator	1	2	3
7.	Compose Extended Format Report	♦ Format and components of a formal report: ♦ Nature of investigation ♦ Facts discovered ♦ Analysis of arguments and opinions ♦ Conclusion and recommendation	1	2	3
8.	Prepare Short Formal Report	♦ Format and component parts of a formal report	1	2	3
9.	Organize Short Informal Report	♦ Format and component parts of an informal report	1	2	3
Sub-Total			**9**	**22**	**31**

Entrepreneurship Development

Total: 78 hrs
Theory: 30 hrs
Practical: 48 hrs

Course description

This course is designed to impart the knowledge and skills on formulating business plan and managing small business in general. This course intends to deal with exploring, acquiring and developing enterprising competencies, identification of suitable business idea and developing of business plan.

Course objectives

After completion of this course students will be able to:

1. Understand the concept of business and entrepreneurship
2. Explore entrepreneurial competencies
3. Analyze business ideas and viability
4. Formulate business plan
5. Learn to manage small business

S. N.	Task statements	Related technical knowledge	Time (hrs)		
			T	P	Total
Unit 1: Introduction to Entrepreneurship			5.75	4.08	9.83
1	**Introduce business**	**Introduction of business:** • Definition of business/enterprise • Types of business • Classification of business • Overview of MSMEs(Micro, Small and Medium Enterprises) in Nepal	1.5		1.5
2	**Define entrepreneur/entrepreneurship**	**Definition of entrepreneur:** • Definition of entrepreneur • Definition of entrepreneurship • Entrepreneurship development process	0.5	0.5	1.0
3	**Describe entrepreneur's characteristics**	**Entrepreneur's characteristics:** • Characteristics of entrepreneurs • Nature of entrepreneurs	0.67	0.83	1.5
4	**Assess entrepreneur's characteristics**	**Assessment of entrepreneur's characteristics:** • List of human characteristics • Assessment of entrepreneurial characteristics	0.5	1.0	1.5
5	Compare entrepreneur with other occupations	**Entrepreneur and other occupations:** • Comparison of entrepreneur with other occupations • Types and styles of entrepreneurs	1.0		1.0
6	Differentiate between entrepreneur and employee	**Entrepreneur and employee:** • Difference between entrepreneur and employee • Benefit of doing own business	0.5	0.5	1.0
7	Assess "Self"	**"Self" assessment:** • Understanding "self" • Self-disclosure and feedback taking	0.6	0.4	1.0
8	**Entrepreneurial personality test:** • Assess "Self" inclination to business	**Entrepreneurial personality test:** • Concept of entrepreneurial personality test • Assessing self-entrepreneurial inclination	0.67	0.83	1.5
Unit 2: Creativity and Assessment			6.5	4.0	10.5
9	Create viable business idea	**Creativity:** • Concept of creativity	1.67	0.33	2.0

		• Barriers to creative thinking			
10	Innovate business idea	**Innovation:** • Concept of innovation • SCAMPER Method of innovation	0.83	0.67	1.5
11	Transfer ideas into action	**Transformation of idea into action:** • Concept of transferring idea into action • Self-assessment of creative style	1.0	0.5	1.5
12	Assess personal entrepreneurial competencies	**Personal entrepreneurial competencies:** • Concept of entrepreneurial competencies • Assessing personal entrepreneurial competencies	0.5	1.0	1.5
13	Assess personal risk taking attitude	**Risk taking attitude:** • Concept of risk • Personal risk taking attitude • Do and don't do while taking risk	1.5	1.0	2.5
14	Make decision	**Decision making:** • Concept of decision making • Personal decision making attitude • Do and don't do while making decision	1.0	0.5	1.5
Unit 3:Identification and Selection of Viable Business Ideas			**0.83**	**3.42**	**4.25**
15	Identify/ select potential business idea • Analyze strength, Weakness, Opportunity and Threat (SWOT) of business idea	**Identification and selection of potential business:** • Sources of business ideas • Points to be considered while selecting business idea • Business selection process • Potential business selection among different businesses • Strength, Weakness, Opportunity and Threats (SWOT) analysis of business idea • Selection of viable business idea matching to "self"	0.83	3.42	4.25
Unit 4: Business Plan			**16.67**	**36.58**	**53.25**
16	Assess market and marketing	**Market and marketing:** • Concept of market and marketing • Marketing and selling • Market forces • 4 Ps of marketing	1.33	0.75	2.08

		• Marketing strategies			
17	**Business exercise:** Explore small business management concept	**Business exercise:** • Business exercise rules • Concept of small business management • Elements of business management · Planning · Organizing · Executing · Controlling	1.58	1.67	3.25
18	Prepare market plan	**Business plan/Market plan** • Concept of business plan • Concept of market plan • Steps of market plan	2.0	2.0	4.0
19	Prepare production plan	**Business plan/Production plan:** • Concept of production plan • Steps of production plan	1.25	1.5	2.75
20	Prepare business operation plan	**Business plan/Business operation plan:** • Concept of business operation plan • Steps of business operation plan • Cost price determination	2.5	2.67	5.17
21	Prepare financial plan	**Business pan/Financial plan:** • Concept of financial plan • Steps of financial plan • Working capital estimation • Pricing strategy • Profit/loss calculation • BEP and ROI analysis • Cash flow calculation	4.5	7.5	12.0
22	Collect market information /prepare business plan	**Information collection and preparing business plan:** • Introduction • Market survey • Precaution to be taken while collecting information • Sample questions for market	2.0	13.0	15.0

		survey			
		• Questions to be asked to the customers			
		• Questions to be asked to the retailer			
		• Questions to be asked to the stockiest/suppliers			
		• Preparing business plan			
23	Appraise business plan	**Business plan appraisal:** • Return on investment • Breakeven analysis • Cash flow • Risk factors	0.5	5.5	6.0
24	Maintain basic book keeping	**Basic book keeping:** • Concept and need of book keeping • Methods and types of book keeping • Keeping and maintaining of day book and sales records	1.0	2.0	3.0
	Total:		30	48	78

Text book:

क) प्रशिक्षकहरुका लागि निर्मित निर्देशिका तथा प्रशिक्षण सामग्री, प्राविधिक शिक्षा तथा व्यावसायिक तालीम परिषद्, २०६९

ख) प्रशिक्षार्थीहरुका लागि निर्मित पाठ्यसामग्री तथा कार्यपुस्तिका, प्राविधिक शिक्षा तथा व्यावसायिक तालीम परिषद् (अप्रकाशित), २०६९

Reference book:
Entrepreneur's Handbook, Technonet Asia, 1981.

Electro Technology

Total: 78 hrs.
Theory: 25 hrs.
Practical: 53 hrs.

Course Description:

This course is designed to provide basic knowledge in electro technology. It intends to provide basic knowledge and skills on electrical and electronics. The trainee will be introduced to basic electrical and electronics.

Course Objectives:
At the end of this course students will be able to:
- Use safety precaution & rules.
- Calculate resistance, capacitance, inductance, power & energy.
- Measure voltage & current
- Install basic electrical components
- Apply resistor, capacitor & diode in electronics circuit.
- Understand the concept of transistor, IC, Logical gate & memories.
- Convert various number system
- Perform project work

S. N.	TASK	RELATED KNOWLEDGE	TIME (IN HOURS)		
			THEORY	PRAC.	TOTAL
1	Identify Hazard and Risk	▪ Introduction of Occupational Health & Safety. ▪ Types of hazard. ▪ Electrical Hazard ▪ Hazard Control Principle.	2	1	3
2.	Use Personal Protective Equipment (PPEs)	▪ PPEs according to work. ▪ Safety precautions and safety rules.	2	1	3
3.	Familiarize with Charge/Voltage /Current/ Resistance / resistivity/conductivity	▪ Introduction to charge, Voltage and Current ▪ Symbol and units ▪ Sources of electricity and potential difference ▪ Flow of current ▪ Resistively of a material ▪ Effect of temperature on resistance ▪ Resistors in series, parallel and mixed(series+parallel) ▪ Resisters colour code ▪ Voltage dividers	3	2	5

4.	Familiarise with electrical signals	▪ AC and DC signals ▪ Frequency and waveform ▪ AC and DC sources	0.5	1	1.5
5.	Perform electrical measurements • Measure voltage • Measure current • Measure resistance	▪ Introduction to Voltmeter, Ammeter, Ohm Meter and Megger ▪ Handling of Voltmeter, Ammeter, Ohm Meter and Megger in a circuit.	0.5	2	2.5
6.	Apply Ohm's law • Connect resistor • Connect DC supply • Verify formula	▪ Statement ▪ formula	0.5	2	2.5
7.	Apply Kirchoff's Law • Connect KCL circuit • Connect KVL circuit • Verify formula	▪ Kirchoff's Current and voltage law ▪ Application of Kirchoff's laws in series and parallel circuits ▪ Numerical problems using Kirchoff's law.	1.5	3	4.5
8.	Calculate electrical power/energy	▪ Definition of power and energy ▪ Relation of power with voltage and current.	0.5	2	2.5
9.	Perform electrical wiring • Mark cable route & components. • Lay cable. • Install PVC conduit pipe/PVC batten. • Install junction Box • Install Fuse • Install Switch • Install Power socket • Install light socket	**Electrical wiring** • Layout diagram • Wiring technique • Marking technique • Cable types & size • Size & uses of junction box. • Introduction, size & uses of Fuse, Switch, power socket, light. • Connection technique	2	10	12
10.	Apply Capacitors in circuit • Connect capacitor in series • Connect capacitor in parallel	▪ Principle of capacitor ▪ Capacitance, Mutual capacitance and Di-electric constant ▪ Charging, discharging ▪ Capacitors in series and parallel	0.5	2	2.5

11.	Apply Inductors in circuit	▪ Principle of inductor ▪ Self, mutual inductance and permeability	0.5	1	1.5
12.	Use Transformers in rectifier circuit	▪ Basic principle and types of transformers	0.5	1	1.5
13.	Apply the principle of semiconductor and diodes • Connect diode in forward bias. • Connect diode in reverse bias.	▪ Introduction of Semiconductor, types of semiconductor, effect of impurities and temperature, majority and minority carriers ▪ Principle and types of semiconductor diodes ▪ Application of Zener diode	4	7	11
14.	Familiarize with transistor	Concept, importance, Principle, types and uses of transistors	2	2	4
15.	Familiarize with I.C.	▪ Principle, types & application of I.C.	1	1	2
16.	Convert various number system	▪ Types of number system (binary, decimal, Octal & Hexadecimal)	2	2	4
17.	Apply the principle of Logical function on Gates	Principle and types of ▪ Logical Function ▪ Truth Table ▪ Logic Gates(NOT, OR, AND, NOR, NAND, Exclusive OR, Exclusive NOR) ▪ memory devices	2	10	12
18	Project Work			3	3
Sub-Total			**25**	**53**	**78**

References:

- B.L. Theraja, A.K. Theraja (Complete Edition), *A text Book of Electrical Technology,* S. Chand & Company, New Delhi.
- I.J. Nagrath, *Basic Electrical Engineering***,** Tata MC Graw Hill, New Delhi.
- V.K. Mehata, Rohit Mehata (Ninth Edition), *Principle of Electronics,* S.Chand & Company LTD, Ramnagar, New Delhi.

Project Work

<div align="right">

Total: 78 hours

Theory: hours

Practical: 78 hours
</div>

Course description:

The project work is provisioned to make the students capable of tackling problems in a real work situation related to computer engineering and information and communication technology. The student applies knowledge and skills gained during the whole course.

The choice of project will depend upon the interest of the student and the nature of the job/project available in the workplace. However, the entire project covers basic computer application, Graphic and web development, database management system, computer programming, computer hardware and networking, system analysis and design, and accounting package.

Course objectives:
After the completion of this course students will be able to:
1. Be familiar with the practical aspects of the real world of the work,
2. Enhance hands on practice skills through integrated project works.

Activities and deliverable:

In addition to the day-to-day activities in the workplace including comprehensive report, each student is required to carry out an individual project work alone or under the supervision of the concerned authority in institute or industry/ organization where the student works.

Each student had to submit a draft report prior to the final report so that the assigned instructor/guide can correct gross mistake. The final report should be submitted to the authority.

Integrated project works
Students can select any **ONE** of the following projects or the project available in the workplace.
At the end of the project students have to compile, submit and present the report.

1. Project work on Graphic design and web page development
2. Project work on Database management
3. Project work on computer programming
4. Project work on Business plan development

Evaluation Scheme:
The evaluation of the performance of the student is to be carried out by three agencies; the concerned institute, industry/organization where the student works and the CTEVT unless otherwise directed by office of the controller of examinations /Technical Division of the CTEVT. The project carries 50 marks. The student has to score 60% or above for successful completion of the course.

On the Job Training (OJT)

Full Marks: 500   **Practical: 24 weeks/960 Hrs**

Description:
On the Job Training (OJT) is a 6 months (24 weeks/144 working days) program that aims to provide trainees an opportunity for meaningful career related experiences by working fulltime in real organizational settings where they can practice and expand their classroom based knowledge and skills before graduating. It will also help trainees gain a clearer sense of what they still need to learn and provides an opportunity to build professional networks. The trainee will be eligible for OJT only after attending the final exam. The institute will make arrangement for OJT. The institute will inform the CTEVT at least one month prior to the OJT placement date along with plan, schedule, the name of the students and their corresponding OJT site.

Objectives:
The overall objective of the On the Job Training (OJT) is to make trainees familiar with firsthand experience of the real work of world as well as to provide them an opportunity to enhance skills. The specific objectives of On the Job Training (OJT) are to;
- apply knowledge and skills learnt in the classroom to actual work settings or conditions and develop practical experience before graduation
- familiarize with working environment in which the work is done
- work effectively with professional colleagues and share experiences of their activities and functions
- strengthen portfolio or resume with practical experience and projects
- develop professional/work culture
- broaden professional contacts and network
- develop entrepreneurship skills on related occupation

Activity:
In this program the trainees will be placed in the real work of world under the direct supervision of related organization's supervisors. The trainees will perform occupation related daily routine work as per the rules and regulations of the organization. In addition to the above, trainees must observe at least one ICT related exhibition/seminar/workshop or telecommunication offices/ tele-center/ ISP within the OJT period.

Potential OJT Placement site:
The nature of work in OJT is practical and potential OJT placement site should be as follows;
- National Planning Commission (National Volunteer Development Voluntary Service)
- District Development Committee
- Municipality
- Tele-centre
- Internet Service Provider
- Tele-medicine Centre
- Software Development Company
- Computer Maintenance Centre
- Educational Institute
- Financial Institute and
- E-enable Services/Organization.

Requirements for Successful Completion of On the Job Training:

For the successful completion of the OJT, the trainees should;

- submit daily attendance record approved by the concerned supervisor and minimum 144 working days attendance is required
- maintain daily diary with detail activities performed in OJT and submit it with supervisor's signature
- prepare and submit comprehensive final OJT completion report with attendance record and diary
- secured minimum 60% marks in each evaluation

Complete OJT Plan:

SN	Activities	Duration	Remarks
1	Orientation	2 days	Before OJT placement
2	Communicate to the OJT site	1 day	Before OJT placement
3	Actual work at the OJT site	24 weeks/960 hrs	During OJT period
4	First-term evaluation	one week (for all sites)	After 6 to 7 weeks of OJT start date
5	Mid-term evaluation	one week (for all sites)	After 15 to 16 weeks of OJT start date
6	Report to the parental organization	1 day	After OJT placement
7	Final report preparation	5 days	After OJT completion

- First and mid-term evaluation should be conducted by the institute.
- After completion of 6 months OJT period, trainees will be provided with one week period to review all the works and prepare a comprehensive final report.
- Evaluation will be made according to the marks at the following evaluation scheme but first and mid-term evaluation record will also be considered.

Evaluation Scheme:

Evaluation and mark distribution are as follows:

S.N	Activities	Who/Responsibility	Marks
1	OJT Evaluation (should be three evaluation in six months –one evaluation in every two months)	Supervisor of OJT provider	300
2	First and mid- term evaluation	The Training Institute	200
	Total		500

- Trainees must secure 60 percent marks in each evaluation to pass the course.
- If OJT placement is done in more than one institution, separate evaluation is required from all institutions**.**

OJT Evaluation Criteria and Marks Distribution:

- OJT implementation guideline will be prepared by the CTEVT. The detail OJT evaluation criteria and marks distribution will be incorporated in the guidelines.
- Representative of CTEVT, Regional offices and CTEVT constituted technical schools will conduct the monitoring & evaluation of OJT at any time during the OJT period.