CURRICULUM

Technical School Leaving Certificate

Information Technology

(Apprenticeship Programme)

Council for Technical Education & Vocational Training (CTEVT)

Curriculum Development Division

Sanothimi, Bhaktapur

2018

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Introduction:

TSLC Curriculum in Information Technology is designed to produce entry level workforce. The graduates will be equipped with required knowledge, skills and attitude necessary to this level to meet the demand of the IT industry in the country and aboard. This curriculum is based on the apprenticeship model in which trainees involve in the real industry practice in the industry.An apprenticeship program combines on-the-job training with academic instruction for those entering the workforce. It is also called dual-training programs because of the combined occupational and in-house components; apprenticeships help individuals put their academic skills to practical use in various careers.

The program extends over 24 months. First fifteen weeks in-house classes insist in theoretical and basic practical skills will be provided in training institutes. They learn the theoritical foundational subjects, communications and soft skills. The trainees acquire theoritical knowledge and do practical in the training institutes. In every subject, topical explanations will be followed by demonstrations by instructors and in all tasks, trainees will be asked to practice by themselves through do-it-yourself/hands-on exercises so that they can internalize what they learn in the classroom.

After completing the fifteen weeks classes in training institutes, students are placed in IT industries for 78 weeks (5 days a week and 8 hours a day) for real practice and they are called in training institute for 1 day a week, where they get some theoretical and practical exposure they find necessary. After the completion of 78 weeks' industrial practice, apprentice students come back to the training institute for the revision and exam preparation for 4 weeks as block release.

Admitted trainees will have the three parties training agreement among trainees, sponsor industries and training institute. The Agreement term and conditions will be implemented during the whole training period.

Rationale

Nepal adopted IT policy in 2002 AD. (2057 B.S) and defined the vision, background, objectives and strategies of computer education in Nepal. The main vision of IT policy of Nepal 2002 A.D. is to "Place Nepal on the global map of information Technology". The policy aims at making information technology accessible to the general public and increase employment through this means, builds a knowledge-based society and establishes knowledge-based industries. To achieve the goal, the policy has strategies to promote, facilitate, regulate, develop and expand information technology with a high priority to the participation of the private sector. To cope with the action plan of disseminating IT curriculum formation is the first step. An apprenticeship curriculum prepares graduates apt to the industry need, so that they get employed and poverty will be elevated. Moreover the IT industries have agreed to form the curriculum and train the students as apprentice so that they won't have the scarcity of skilled workers updated with their technologies in low cost.

Course Title:

TSLC in Information Technology (Apprenticeship Programme)

Aim:

The aim of this programme is to produce competent workforce equipped with IT skills and knowledge to undertake any IT industry, collage or business company.

Objectives:

On completion of the course the graduates will be enabled to:

- Impart skills and knowledge on performing the job carried out in IT industries.
- Handle email, internet and web page
- Apply basic IT skills
- Design, implement, and reflect on a technology-based project.
- Communicate effectively in a variety of professional contexts.
- Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Analyze user needs and to take them into account in the selection, creation, integration, evaluation, and administration of computing based systems. [IT]

Course Duration

This course will be completed within 24 months after the enrolment in a formal setting.

The total hours for the course will be 4378 hours in the 24 months of period. Pre-training course (maximum 15 weeks) and at the last month of the whole course Block Release Training (maximum 4 weeks) programme will be conducted in the Institute. Industrial Practice & related skills will be learnt in the related sponsor industries.

The details of the course duration are as follows:

A. Institute Based Instruction:	**1258 hours**
• Pre training course:	15 weeks (600 hours)
• One day/week for 78 weeks:	78 days (498 hours)
• Block Release:	4 weeks (160 hours)
B. Industry Based Training (Hands on Practice):	**3120 hours**
• Hardware Assembly, Repair and Maintenance:	12 weeks (480 hours)
• Networking:	12 weeks (480 hours)
• Graphic and Web Design:	12 weeks (480 hours)
• Specialization in Any Department:	42 weeks (1680 hours)

Entry Criteria:

Individuals with following criteria will be eligible for this program:

- SEE with any grade and any GPA (Since 2072 SLC).
- SLC appeared (Before 2072 SLC).
- Nepali citizen above 16 years of age.
- Pass entrance examination administered by CTEVT.
- Candidates will be recruited on the merit base of entrance examination.

- Selected candidates should pass the interview conducted jointly by industry and the training institute.
- Mentally & physically sound.

Group size:

The group size of this program will be 40.

Medium of Instruction:

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

Pattern of Attendance:

The students should have 80% attendance in theory classes and 90% in practical/ performance to be eligible for internal assessments and final examinations.

Instructors' Qualification

- Bachelor's degree in IT or Diploma IT with three years' experience.
  Preferable Skills:
- Good communication/instructional skills
- Experience in the related field

Teacher and Student Ratio:

- Overall ratio of teacher and student must be 1:10 (at the institution level).
- Teacher and students ratio for theory class should be as per nature of classroom
- Teacher and student ratio for practical should be 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, Individual training packets, Procedure sheets, Performance Check lists, Textbooks etc.).
- Non-projected Media Materials (Display, Photographs, Flip chart, Poster, Writing board etc.).
- Projected Media Materials (Multimedia, Overhead transparencies, Slides etc.).
- Computer-Based Instructional Materials (Computer-based training, Interactive video etc.)
- Food commodities, kitchen tools and equipment

Teaching Learning Methodologies:

The methods of teaching for this curricular program will be a combination of several approaches such as:

- Theory: Lecture, group discussion, Assignment, Group work.
- Practical: Demonstration, Observation and Self-practice, guided practice, tutorial.
- Industrial Practice: Real practice under the supervision of Industrial Supervisor.

Evaluation Details:

- The distribution of marks for theory and practical tests will be as per the marks given in the course structure of this curriculum for each subject. 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%
3	Industrial Practice	100%		60%

- There will be three internal assessments conducted by institute and one final examination in each subject at the end of programme. 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 every internal assessment to appear the final exam.
- Continuous evaluation of the students' performance is to be done by the related instructor/ trainer/industrial supervisor to ensure the proficiency over each competency under each area of a subject specified in the curriculum.
- Performance evaluation of industrial practice should be done by the related In-company Trainer (Industrial Supervisor).

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 of "**Technical School Leaving Certificate in Information Technology (Apprenticeship)"** to those students who successfully complete the requirements as prescribed by the curriculum.

Career Path:

The graduate will be eligible for the position equivalent to Non-gazetted 2nd class/level 4 (technical) in the government related organizations or as prescribed by the Public Service Commission of Nepal or the concerned authorities (IT industries) of the Federal Democratic Republic of Nepal.

Course Structure

S. N	Subjects	Nature	Hours/ Week			Total Hours		
			T	P	Total	T	P	Total
A.	**Institute based Training (3.5 Months - 15 Weeks)**							
1.	Applied Communication and Professionalism	T+P	5	5	10	75	75	150
2.	Fundamental of Information Technology	T+P	3	3	6	45	45	90
3.	Graphic and Web Designing	T	2	6	8	30	90	120
4.	Hardware Assembly, Repair and Maintenance	T+P	2	6	8	30	90	120
5.	Networking	T+P	2	6	8	30	90	120
	Sub Total of A		**14**	**26**	**40**	**210**	**390**	**600**
B.	**Institute Base Class Every weeks one day (18 months – 78 weeks) 78 days**							
1.	Graphic and Web Designing	T+P				52	104	156
2.	Hardware Assembly, Repair and Maintenance	T+P				52	80	132
3.	Networking	T+P				52	80	132
4.	Entrepreneurship Development	T+P				30	48	78
	Sub Total of B					**186**	**312**	**498**
C.	**Industrial Practices (18 months - 78 weeks)**							
1.	Graphic and Web Designing (12 weeks)	P					480	480
2.	Hardware Assembly, Repair and Maintenance (12 weeks)	P					480	480
3.	Networking (12 weeks)	P					480	480
4.	Any/all three Departments as per the requirement of industries and interest of the students (42 weeks)	P					1680	1680
	Sub Total of C						**3120**	**3120**
D.	**Block Release (4 weeks – 1 month)**	**T+P**				**80**	**80**	**160**
E.	**Exam Preparation and Final Exam (7 Weeks)**							
	Grand Total					**476**	**3902**	**4378**

Evaluation Scheme

S.N.	Subjects	Nature	Total Hours			Full Marks		
			T	P	Total	T	P	Total
A.	**Institute base Training (15 Weeks + 1 day/week for 78 weeks)**							
1.	Applied Communication and Professionalism	T+P	75	75	150	50	50	100
2.	Fundamental of Information Technology	T+P	45	45	90	25	25	50
3.	Graphic and Web Designing	T	82	194	276	50	150	200
4.	Hardware Assembly, Repair and Maintenance	T+P	82	170	252	50	100	150
5.	Networking	T+P	82	170	252	50	100	150
6.	Entrepreneurship Development	T+P	30	48	78	20	30	50
	Sub Total		**396**	**702**	**1098**	**245**	**455**	**700**
B.	**Industry Based Training (78 weeks @ 40 hours/week)**							
1.	Graphic and Web Designing (12 weeks)	P		480	480		200	200
2.	Hardware Assembly, Repair and Maintenance (12 weeks)	P		480	480		200	200
3.	Networking (12 weeks)	P		480	480		200	200
4.	Any/all three sectors as per the requirement of industries and interest of the students (42 weeks)	P		1680	1680		700	700
	Sub Total			**3120**	**3120**		**1300**	**1300**
C.	**Block Release (4 weeks @ 40 hrs/week)**	**T+P**	80	80	160			
	Grand Total		**476**	**3902**	**4378**	**245**	**1755**	**2000**

Applied Communication and Professionalism

Total Time: 150 hours
Lecture: 75 hours
Practical: 75 hours

Course Description:
This course is designed for the development of communication skill in Nepal and English language and enhances student professional skill in working places. The communication skill focus on English and Nepali language communication skills specially in speaking for to-be professional technicians of Nepal who will work in national and international labor market after completing the professional course in their respective sector from the Technical Training Center /Institutes. Professional development course enhancing professional development through self-motivation, positive attitudes, decision making skill, creativity skill, stress and time management knowledge, team work and leadership skill in a student life and professional careers.

Course Objective:
After the completion of this course the students will be able to:

- Communicate on relevant day to day activities
- Sharpen their speaking and writing skills in English and Nepali Language.
- Impart relevant knowledge on self-motivation, creativity and positive thinking.
- Explain importance, influence and methods of managing time and stress.
- Follow decision making process, team building and leadership to the efficient organizational functioning.

Course Contents (Theory): 75 hrs

Units	Topics	Contents	Hours
1	**Communicative functions/ Conversation skills**		**15 hrs**
		1.1 Everyday functions: 1.1.1 Greetings, 1.1.2 Welcoming, 1.1.3 Introductions, 1.1.4 Thanking, 1.1.5 Excuses/apologizing/forgiving	4
		1.2 Everyday Activities: 1.2.1 Asking about activity 1.2.2 Asking about trouble/problems/conditions 1.2.3 Asking about health status 1.2.4 Telling not to interrupt/disturb	4
		1.3 Requests and offers 1.3.1 Making requests 1.3.2 Offers: Offering, Accepting, Declining 1.3.3 Excuses: Asking to be excused, Excusing 1.3.4 Permission: Asking for permission, Giving permission	4
		1.4 Expressing	3

Units	Topics	Contents	Hours
		1.4.1 Likes/dislikes 1.4.2 Hopes/wishes 1.4.3 Advice/suggestions/recommendations 1.4.4 Prohibitions	
2	**Comprehension and Writing skills**		**20 hrs**
		2.1 Comprehension passages	3
		2.2 Technical Terms	3
		2.3 Writing Paragraphs	2
		2.4 Writing letters 2.4.1 Resume/bio-data 2.4.2 Applications letters 2.4.3 Business letters	4
		2.5 Writing work reports	4
		2.6 Writing Instructions	2
		2.7 Writing dialogues	2
३	**नेपाली संचार**		**१६ घण्टा**
		३.१ प्राविधिक शब्दहरु	२ घण्टा
		३.२ बोधअभिव्यक्ति	२ घण्टा
		३.३ अनुच्छेद लेखन	२ घण्टा
		३.४ पत्रलेखन: क. व्यापारिक पत्र ख. निवेदनपत्र ग. व्यक्तिगतविवरण (बायोडाटा) लेखन	३ घण्टा
		३.५ निबन्ध लेखन	२ घण्टा
		३.६ कार्य प्रतिवेदन लेखन	३ घण्टा
		३.७ भौचर लेखन	२ घण्टा
4	**Motivation, Attitudes, Decision Making & Creativity**		**12 hrs**
		4.1 Motivation: 4.1.1 Self-motivation 4.1.2 Features of self-motivation • Honesty, • Enthusiasm, • Dedication • Productiveness	3
		4.2 Attitudes: 4.2.1 Positive and Negative attitudes 4.2.2 Factors affecting attitudes 4.2.3 Positive attitude and advantages 4.2.4 Negative attitude & disadvantages	3
		4.3 Decision Making to solve problem: 4.3.1 Decision making and problem solving;	3

Units	Topics	Contents	Hours
		4.3.2 Steps of problem solving; 4.3.3 Steps of decision making process.	
		4.4 Creativity 4.4.1 Meaning 4.4.2 Purpose 4.4.3 Technique to improve creative thinking skills.	3
5	**Stress and Time Management**		**6 hrs**
		5.1 Stress Management 5.1.1 Definition of stress 5.1.2 Causes and consequences of stress 5.1.3 Stress management techniques	3
		5.2 Time Management 5.2.1 Meaning 5.2.2 Time wasters 5.2.3 Effective time management strategy	3
6	**Team work and Leadership**		**6 hrs**
		6.1 Team Work 6.1.1 Definition 6.1.2 Purpose 6.1.3 Characteristic of champion team 6.1.4 Interpersonal relationship	3
		6.2 Leadership Skill 6.2.1 Leadership Power 6.2.2 Leadership Styles 6.2.3 Public Speaking and Presentation	3

Practical **75 hrs**

Units	Task	Hours
1	1.1 Compose a dialogue introducing new friend in the class. 1.2 Compose a dialogue ting new friend in the class. 1.3 Make a request to the teacher for checking your practical work. 1.4 Compose a dialogue offering drinks to the (supposed) guests.	**15**
2	2.1 Prepare your own resume/bio-data. 2.2 Write a job application. 2.3 Write a letter to the Business Company or industry for the delivery of goods. 2.4 Write a report of a complete task you performed.	**15**
३	३.१. नेपाली निवेदन लेख्नुहोस् । ३.२. आफुनो अभ्यास कार्यलाई आवश्यक पर्ने सामान अर्डर गरी सम्बन्धित उद्योगलाई एक पत्र लेख्नुहोस् । ३.३. आफुनो व्यक्तिगत विवरण तयार पार्नुहोस् । ३.४. वर्तमान सन्दर्भमा सूचना प्रविधिको आवश्यकता विषयमा २५० शब्दमा एक निबन्द लेख्नुहोस । ३.५. आफूले एक दिन गरेको अभ्यासका आधारमा कार्य प्रतिवेदन लेख्नुहोस । ३.६. बैंक भौचरको नमूना तयार पार्नुहोस् ।	**15**
4	4.1 Demonstrate and show the self-motivate people's behaviors in class room. 4.2 Demonstrate and show the positive and negative attitudes peoples behave in class room. 4.3 Take decision using decision making process on given problems by class teacher. 4.4 Perform the creativity skill on class room on the given situation.	**10**
5	5.1 Perform the stress management techniques in class room. 5.2 Perform the time management techniques in class room.	**10**
6	6.1 Perform the team building practices and team work activities in class room. 6.2 Perform public speaking applying presentation skills on given topic in class room.	**10**

References:

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3. Kathmandu.
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5. Surya Sinha (2017). Complete Personality Development Course (Hindi Edition).
6. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGraw Hill
7. Lucas, Stephen (2001). Art of Public Speaking. New Delhi. Tata - Mc-Graw Hill.

Fundamentals of Information Technology

Total Time: 90 hours
Theory: 45 hours
Practical: 45 hours

Course Description

This course provides basic knowledge and skill of Basic Hardware, Operating System and Microsoft's suite of productivity products known as Office, or MS Office, is a fixture at businesses around the world. The Office suite includes Word, a word-processing program; Excel, a financial spreadsheet program; Publisher, for desktop publishing; PowerPoint, a program for creating presentations. Knowing how to use MS Office is essential at many businesses, and you can require skills from basic to advance in a job posting to ensure potential employees will be equipped to manage the job.

Course Objectives

After the completion of this course, the student will be able to:

- Describe the computer system peripherals and uses of information and technology.
- Apply the interment, email and social media in practical life.
- Describe the webpage and basic database concept for the further knowledge.
- Perform the entry-level skills for most office work include the ability to open, create, save and modify documents in Word, send and receive email in Outlook and create spreadsheets in Excel.
- Format the documents for printing comfortably using the printer menu to preview documents before they are printed and print the pages.
- Change the font, the margins, insert or delete pages and use the built-in spellchecker and grammar check should be part of a basic skill set.

Course Contents (Theory) **45 hours**

Unit 1: Basic Hardware **2 hrs**

1.1. Basic components of computer (CPU, Monitor, Keyboard, Mouse, Printer, Scanner, Speaker, Pen drive, DVD/CD, etc.)
1.2. Concepts to assemble/disassemble computer components
1.3. Switching on/off computer
1.4. Connecting/disconnecting/use of various computer components
1.5. Preventive safety and maintenance

Unit 2: Operating System (Windows OS) **4 hrs**

2.1 Start/shutdown computer (login/logout)
2.2 Create user account

2.3 Set/unset login password
2.4 Install/uninstall software
2.5 Copy/ save files
2.6 Create/delete/rename folder or file
2.7 Sort/search files
2.8 Use various accessory applications of Windows
2.9 Personalize desktop screen and change resolution

Unit 3: Typing Practice **2 hrs**

3.1 English Typing
3.2 Nepali Typing

Unit 4: Basic Micro-Office Package **2 hrs**

4.1 MS-Word
4.2 MS-Excel
4.3 MS-PowerPoint

Unit 5: Internet **10 hrs**

5.1 Connecting to Internet (Basic)
5.2 Web browser (bookmarking, browse history, basic settings of browser)
5.3 Email services (open new account, send/receive email message, various features of email service)
5.4 Browsing website
5.5 Using search services
5.6 Using social media

Unit 6: Google Services **5 hrs**

6.1 Gmail
6.2 Google drives
6.3 Google Docs (various spreadsheets)

Unit 7: Webpage Development **5 hrs**

7.1 Basics of HTML and CSS (static webpage development)
7.2 Basic features of Photoshop
7.3 Multimedia and its tools

Unit 8: **Database** **5 hrs**

8.1 MS-Access (Table, Query, Form and Report)

Unit 9: C-Programming **5 hrs**

9.1 Basic concepts of computer programming (design simple algorithm and write program)

Unit 10: Cyber Safety **5 hrs**

10.1 Basic risks and dangers on Internet and social media (prevalent cybercrimes in Nepal, e.g., piracy, fake profile, online threats, cyber stalking/bulling, spam, phishing, scams, identity theft)

10.2 Preventive measures from cyber-crimes.

10.3 Cyber ethics and laws (Nepal)

Practical 45 hours

Unit 1: MS-WORD **20 hrs**

1.1 Getting Started with Word 2010

1.1.1 Starting Word
1.1.2 Opening a saved Word document
1.1.3 The Word 2010 Window
1.1.4 Entering text in a document
1.1.5 Previewing a document
1.1.6 Saving a document
1.1.7 Creating a folder
1.1.8 Printing a document
1.1.9 Closing a document and exiting Word

1.2 Editing a Document

1.2.1 Navigate through a document
1.2.2 Scroll through text
1.2.3 Insert and delete text in a document
1.2.4 Select text
1.2.5 Undo and redo commands
1.2.6 Use drag and drop to move text
1.2.7 Copy, cut and paste
1.2.8 Use the clipboard
1.2.9 Clear formatting

1.3 Formatting a Document

1.3.1 Format and align text
1.3.2 Line and paragraph spacing
1.3.3 Add bulleted and numbered lists
1.3.4 Add borders and shading

1.4 Using Editing and Proofing Tools

1.4.1 Document views
1.4.2 Spell and grammar check
1.4.3 Shortcut Menus
1.4.4 Find and replace text

1.5 Changing the Layout of a Document

1.5.1 Adjust page margins.
1.5.2 Change page orientation
1.5.3 Create headers and footers.
1.5.4 Set and change indentations
1.5.5 Insert and clear tabs.

1.6 Inserting Elements to Word Documents

1.6.1 Insert and delete a page break
1.6.2 Insert page numbers
1.6.3 Insert the date and time
1.6.4 Insert special characters (symbols)
1.6.5 Insert a picture from a file
1.6.6 Resize and reposition a picture.
1.6.7 Using Words new picture tools

1.7 Working with Tables

1.7.1 Insert a table
1.7.2 Convert a table to text
1.7.3 Navigate and select text in a table
1.7.4 Resize parts of a table
1.7.5 Align text in a table
1.7.6 Format a table
1.7.7 Insert and delete columns and rows
1.7.8 Borders and shading
1.7.9 Repeat table headings on subsequent pages
1.7.10 Merge table cells

1.8 Working with Columned Layouts & Section Breaks

1.8.1 Columns
1.8.2 Section breaks
1.8.3 Creating columns
1.8.4 Newsletter style columns
1.8.5 Changing part of a document layout or formatting
1.8.6 Remove section break
1.8.7 Add columns to remainder of a document
1.8.8 Column widths
1.8.9 Adjust column spacing
1.8.10 Insert manual column break

1.9 Using Mail Merge

1.9.1 The Mail Merge Features
1.9.2 Merge Envelopes and Labels
1.9.3 Create a Data Source Using Word

1.10 Adding Reference Marks Notes

1.10.1 Add Captions
1.10.2 Add Cross-References
1.10.3 Add Bookmarks
1.10.4 Add Hyperlinks
1.10.5 Insert Footnotes and Endnotes

1.11 Simplifying and Managing Long Documents

1.11.1 Insert Blank and Cover Pages
1.11.2 Insert an Index
1.11.3 Insert a Table of Contents

Unit 2: MS-EXCEL **20 hrs**

2.1 Getting Started with Excel

2.1.1 Navigate the Excel User Interface
2.1.2 Use Excel Commands
2.1.3 Create and Save a Basic Workbook
2.1.4 Enter Cell Data

2.2 Performing Calculations and Modify a Worksheet

2.2.1 Find and Select Text
2.2.2 Modify Text
2.2.3 Find and Replace Text
2.2.4 Insert, Delete, and Adjust Cells, Columns, and Rows
2.2.5 Search for and Replace Data
2.2.6 Insert Comment

2.3 Formatting a worksheet and Printing Workbook

2.3.1 Modify Fonts
2.3.2 Add Borders and Colors to Worksheets
2.3.3 Apply Number Formats
2.3.4 Align Cell Contents
2.3.5 Apply Styles and Themes
2.3.6 Apply Basic Conditional Formatting
2.3.7 Create and Use Templates
2.3.8 Preview and Print a Workbook
2.3.9 Define the Page Layout

2.4 Basic Math and Statistics

2.4.1 Utilize basic mathematics including add, sub, multiplication and division.
2.4.2 Learn basic math function including SUM, ROUND, SUBTOTAL
2.4.3 Learn basic statistical function including COUNT, AVERAGE, MAX, MIN, and MODE

2.5 Changing the Layout of a Document

2.5.1 Adjust page margins.
2.5.2 Change page orientation
2.5.3 Create headers and footers.
2.5.4 Set and change indentations

2.6 Inserting Elements to Word Documents

2.6.1 Insert and delete a page break
2.6.2 Insert page numbers
2.6.3 Insert the date and time
2.6.4 Insert special characters (symbols)
2.6.5 Insert a picture from a file
2.6.6 Resize and reposition a picture.
2.6.7 Using Words new picture tools

2.7 Optimizing Data

2.7.1 Sorting
2.7.2 Filtering
2.7.3 Naming Ranges

2.8 Visualizing Data with Basic Charts

2.8.1 Create Charts
2.8.2 Modify and format Charts

2.9 Goal Seek and Solver

2.9.1 What-if Analysis Using Goal Seek
2.9.2 Using Solver to complete A What-if
2.9.3 Adding Constraints to Solver

2.10 Understanding Dates

2.10.1 Understand how dates works in Excel using the
2.10.2 TODAY, YEAR, MONTH, DAY and DATE function
2.10.3 Logic Function
2.10.4 Learn to builds standalone logical IF function and make them
2.10.5 More complex by nesting AND or OR within them

Unit 3: MS-POWERPOINT 5 hrs

3.1 Creating Presentations

3.1.1 Explore the PowerPoint workspace
3.1.2 Parts of the PowerPoint window
3.1.3 Plan your presentation
3.1.4 Create a presentation using a template
3.1.5 Save your presentation

3.2 Working with a Presentation

- 3.2.1 Create a presentation using an existing theme
- 3.2.2 Enter text in the slide pane
- 3.2.3 Add and delete slides
- 3.2.4 Create an outline
- 3.2.5 Insert slides from another presentation
- 3.2.6 Rearranging slides in the slide sorter

3.3 Inserting Slide Elements & Objects

- 3.3.1 Add header and footer
- 3.3.2 Select shapes and objects
- 3.3.3 Using Power Points new picture editing tools
- 3.3.4 Insert and modify images and pictures
- 3.3.5 Scale an image
- 3.3.6 Insert and format a table
- 3.3.7 Insert a MS Excel chart

3.4 Producing a Slide Show

- 3.4.1 Slides transition
- 3.4.2 Add sound to slides
- 3.4.3 Animate slides text and objects

References:

1. Alexis Leon & Mathews Leon (2009). Fundamentals of information technology, 2/e. New Delhi. Vikas Publishing House.
2. Turban, R. R. (2014). *Introduction to information technology.* John Wiley and Sons (Asia) Pvt. Ltd.
3. Morley, D. &. (2013). *Understanding computers today and tomorrow.* Cangage Learning.
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8. Melton, B. (Ed.). (2013). *Microsoft Office Professional 2013.* Sebastopol, Calif: O'Reilly Media.
9. Melton, Beth, Dodge, Mark. (2013). Microsoft Office Home and Student 2013 Step By Step. India: PHI
10. Patrice-Anne Rutledge. (2014),Office 2013 All-In-One Absolute Beginner's Guide ISBN:9789332539372 , Pearson India

Hardware Assembly, Repair and Maintenance

Total Time: 120 hours
Theory: 30 hours
Practical: 90 hours

Course Description:

This course provides basic knowledge and skills on computer hardware parts, the process of assembly and repairs the parts in case of any issue. The course is designed to develop the skill set suitable to basic computer maintenance and troubleshooting in different software organizations, bank or any other place where computer system is being used.

Course Objectives:

After the completion of this course, the student will be able to:

- Assemble Computer hardware components.
- Connect different peripherals including printer and scanners.
- Troubleshoot power and backup issues in computer systems.
- Install operating systems and different application / utility software.
- Repair and handle basic mobile phone functionality.

Course Contents

Theory

Unit 1: Computer Systems **1 hr**

1.1. Basic introduction of Computers

1.2. Brief history

Unit 2: Computer components **2 hrs**

2.1. Input devices (Keyboard, Mouse, Microphone, Camera, scanner)

2.2. Output devices (Display, Speaker, printer)

2.3. Processor

2.4. Motherboard

2.5. Memory & its slot

2.6. Data cable and power cable

2.7. Casing

2.8. Power supply

2.9. PCI Devices

2.10. Storage devices (HDD, Optical disk, Flash Disk)

2.11. Slots & ports

2.12. Hardware

2.13. Software
2.14. Utilities
2.15. Application Software
2.16. Computer room protection

Unit 3: Printers 1 **hr**

3.1. Printer components
3.2. Printer driver
3.3. Replacement of toner/cartridge
3.4. Connecting printer
3.5. Troubleshooting Printer
3.6. Basic Operation
3.7. Types of Printer
3.8. Resolution
3.9. Port/slot

Unit 4: Scanners **1 hr**

4.1. Scanner components
4.2. Installing Scanner driver
4.3. Connecting Scanner
4.4. Troubleshooting Scanner
4.5. Basic Operation
4.6. Types of Scanner
4.7. Resolution
4.8. Port/slot

Unit 5: Power Backup System **1 hr**

5.1. Installation of UPS Power backup system
5.2. Importance
5.3. Types
5.4. Maintenance

Unit 6: Assembling Computer **3 hrs**

6.1. Assembling Casing

6.2. Assembling motherboard, RAM, hard Disk, processor, optical drive, cards, Slots/ports, display

6.3. Installation of processor with heat sink

6.4. Installation of SMPS

6.5. Installation of optical drive

6.6. Connecting interfaces

6.7. Connecting Display

6.8. Connecting keyboard

6.9. Connecting mouse and input units

6.10. Soldering

6.11. Clamping wires

Unit 7: Operating MS-DOS & Linux **2 hrs**

7.1. Create/Save/Copy/Move/Delete files

7.2. Make/Change/Remove directory

7.3. Format disks

7.4. Change attributes

7.5. Create/use BAT / Shell files

7.6. External and Internal Command

7.7. Getting help about commands

7.8. Changing current directory, getting list of files

Unit 8: Install Operating System **2 hrs**

8.1. System requirements

8.2. Installation process of Operating Systems including Windows, Linux, MAC

8.3. Driver Installation

8.4. Application Software

8.5. File system

8.6. Process of partition

Unit 9: Installation Utilities & Application Software **2 hrs**

9.1. Anti Virus

9.2. Disk Compression tools

9.3. Disk defragmentation and scandisk

9.4. Microsoft Office & other related tools

9.5. Licensed Vs. Free Vs. Trial software installation

9.6. Custom installation

9.7. Driver installation

9.8. Uninstalling software

9.9. Registry setup and cleanup

Unit 10: Operate Multimedia **2 hrs**

10.1. Projector

10.2. Digital camera

10.3. Audio - video

10.4. Connectors - VGA, HDMI

10.5. Different mode of using secondary display (like duplicate, extend etc.)

Unit 11: Computer Security **3 hrs**

11.1. Concept of Firewall (Setup/Enabling/Disabling) and its usages

11.2. Create/delete password on computer

11.3. Concept of Virus -Malware, Worms, Trojan, Spyware, Adware

11.4. Introduction to Personal & General Security of Personal Computer

11.5. Ideas of Password Protection to Personal Computer

11.6. Internet Browser Security & Web Security

11.7. Disk Encryptions

Unit 12: Laptops **2 hrs**

12.1. Laptops and its components

12.2. Ports

12.3. Power system

Unit 13: Troubleshooting computer system faults **5 hrs**

13.1. System Case, LED or Case Buttons

13.2. Key Lock

13.3. Power Sources and Power Protection Devices

13.4. Cooling fans & air circulation

13.5. Motherboard and System Devices

13.6. CMOS Memory or Real-Time Clock

13.7. System BIOS

13.8. Resources and Expansion Cards

13.9. Processor Problems

13.10. System Memory, Memory Not Recognized, Out of Memory Problems, Performance Issues, Upgrade RAM

13.11. Video Cards Image Quality Problems, Performance or Video Mode Issues, Monitors

13.12. Hard Disk Drives and data recovery

13.13. Booting or Operation Problems & Configuration Issues

13.14. Disk Compression Issues

13.15. File System Problems, File recovery

13.16. CD/DVD-ROM Drives, Drive Not Recognized

13.17. Audio Issues

13.18. Peripheral I/O Ports, Keyboards, Mice

13.19. Modems, Network Card, Operation and Connection Problems

13.20. Performance Issues

13.21. Applications Program Failure

13.22. Restoring system to last known configuration

13.23. System Cleanup – Blowing dust away

13.24. Diagnosing connectivity and power issues using ammeter and multimeter

Unit 14: Mobile Utilities **3 hrs**

14.1. Different types of mobile sets

14.2. Smart phones

14.3. Basic operations – Software/App installation, Power issues, Screen issues, Antivirus, File transfer using different tools

14.4. Bluetooth connectivity and usage

14.5. WiFi& Mobile Internet

14.6. Mobile Data backup and factory reset

Practical 90 hrs

1. Identify the following computer parts: Casing, Motherboard, Power supply, Processor, RAM, ROM, Battery, Mouse, Keyboard, Speakers, Ports, Cables, Flash disks, CD-ROM, Monitor.
2. Assemble computer parts.
3. Install Windows 10 operating systems.
4. Install Linux operating systems.
5. Create system users and roles in Windows and Linux based environments.
6. Install Office packages.
7. Install antivirus and utility tools like zip too, browsers, text editors
8. Install drivers for sound, video, NIC.
9. Install printer and driver.
10. Install scanner and drivers.
11. Perform antivirus scan, update, quarantine and deleting files.
12. Perform OS update
13. Troubleshoot – Motherboard issues, processor issue, RAM issues, power issues, peripheral parts issues, sound, video, camera not working, monitor.
14. Perform Disk fragmentation and clean-up.
15. Perform Data recovery.
16. Perform system cleanup using blowers
17. Use ammeter and multimeter to diagnose connectivity issues.
18. Join multimedia projector through VGA and HDMI ports and different modes of projection.
19. Setup mobile phone – SIM card, Data pack, Memory management, Antivirus
20. Mobile to Mobile data transfer

(Note: Additional 52 hours theory and 104 hours practical will be provided during the industrial practice period at training institution)

Reference Books:

1. Win Rosch, The hardware Bible 3rd Edition
2. Computer Operator Google, Author by Er. Suvash Chandra Gautama
3. Easy Computer Operator, Author by Binod Singh Yadav
4. Highway of Advanced Computer Operator, Author by Gunaraj Bhandari/ Kamal Prasad Dhungel
5. Mobile Phones and Tablets Repairs: A Complete Guide for Beginners and Professionals, Chukky Oparandu
6. Mark Minasi, The Complete

Networking

Total Time: 120 hours
Theory: 30 hours
Practical: 90 hours

Course Description:

This course provides basic knowledge and introduction about the Computer networking, setting up of computer network, cabling and troubleshoot network and internet related issues. The course is designed to develop the skill set to establish a network in any office and provides basic idea of dealing with day to day network related issues.

Course Objectives:

After the completion of this course, the student will be able to:

- Be acquainted with networking types and techniques.
- Perform network wiring and join different computers through network.
- Assign IP addresses and join computers to workgroups.
- Configure shared folders, shared printers.
- Setup internet
- Deal with optical fibers
- Deal with basic intercom lines
- Familiarize with basic web hosting

Course Contents

Theory **30 hrs**

Unit 1: Computer Networking **1 hrs**

1.1 Introduction

1.2 Types (LAN/ MAN/ WAN)

1.3 Function

Unit 2: Topology and transmission media **2 hrs**

2.1 Topology (point-to-point, star, bus, ring)

2.2 Transmission speed

2.3 Transmission medium Cable (twisted pair cable, coaxial cable, optical fiber cable, wireless)

Unit 3: Network Protocols and Assigning IP address **2 hrs**

1.1 Relationship between Ethernet and TCP/IP

1.2 IP Address Introduction

1.3 IP Address Types (class A, B, C, D, E)

1.4 Subnet mask

1.5 Global address and private address

1.6 Broad cast address

1.7 Multi cast address

1.8 TCP and UDP

1.9 IPv4 and IPv6

1.10 ICMP

1.11 ARP and RARP, MAC address

1.12 Major network commands of TCP/IP (Ping, IP Configuration, etc.)

Unit 4: Install and Configure **2 hrs**

2.1 NIC

2.2 Modem

2.3 Repeater

2.4 HUB and Switching HUB

2.5 Bridge

2.6 Router

Unit 5: Network Wiring **2 hrs**

3.1 Marking cable route & components

3.2 Laying cable

3.3 Installation of PVC conduit pipe/PVC batten

3.4 Installation of junction Box

3.5 Installation of Jack Socket

Unit 6: Connecting Network Cables **2 hrs**

4.1 Connecting RJ45 Jack

4.2 Connecting RJ45 Socket

4.3 Cable types & size

4.4 Jacks & Connector

4.5 Clamper

4.6 Connection tester

4.7 Multimeter

4.8 Soldering process

4.9 Optical fiber related connections

Unit 7: Configuration of networking services in windows and Linux **2 hrs**

5.1 Sharing file/folder/drive

5.2 Sharing printer/scanner

5.3 Sharing Internet

5.4 Searching computer on network.

5.5 Assigning workgroup

5.6 Assigning computer name

5.7 Joining in Active Directory

Unit 8: Configure printing system in networking services **1 hrs**

6.1 Network Printer

6.2 Printer server

6.3 Permission

Unit 9: Configure **2 hrs**

7.1 FDDI

7.2 Wireless LAN – indoor and outdoor setup

Unit 10: Internet **2 hrs**

8.1 Setup internet connectivity

8.2 Internet Gateway

Unit 11: Remote access configuration **1 hrs**

9.1 Remote desktop in windows

9.2 VNC & other UI tools for Linux

Unit 12: Network Security **2 hrs**

10.1 Setting up and update of Antivirus, Anti Spyware

10.2 Setting up and usage of Firewall

Unit 13: Troubleshooting **2 hrs**

11.1 Computers not joining in network

11.2 Access issues

11.3 Wireless connection issues

11.4 Internet issues

Unit 14: Web Hosting **2 hrs**

12.1 Concept of DNS

12.2 Domain Registry process

12.3 Web server concept

Unit 15: Intercom and Phone Lines **1 hrs**

13.1 Intercom setup with phones

13.2 Planning and connection

13.3 Troubleshooting connectivity issues

Unit 16: ISP concepts **2 hrs**

14.1 Introduction to ISPs

14.2 House hold user level services – connectivity issues, detection of fault, setting up routers, WiFi networks, Bandwidth management and restriction, Performance issues resolution, Monitoring

14.3 Fiber optic connection issues

14.4 Net TV – setup, troubleshooting – connection issues and resolution, Monitoring

Unit 17: CCTV installation and setup **2 hrs**

17.1 Installation of CCTV hardware

17.2 Installation of CCTV utility and software

17.3 Manage CCTV storage

Practical **90 hrs**

Perform the following tasks:

1. Identify network components – Wires, NIC, Modem
2. Identify network topologies – Bus, Ring, Star
3. Install NIC driver.
4. Setup Routers.
5. Perform network wiring and faceplates.
6. Connect network cables in Bus topology
7. Connect network cables in Ring topology
8. Connect network cables in Start topology
9. Configure network in Windows bases systems.
10. Configure network in Linux bases systems.
11. Setup internet
12. Perform network-based security by installing antiviruses.
13. Transfer files across LAN.
14. Setup Wireless Network.
15. Work with optical fibres and its connectivity.
16. Join computers to Active Directory.
17. Setup remote logins
18. Host a php based service in tomcat.
19. Perform Intercom based on phone lines.

20. Configure WiFi router for an ISP.
21. Configure ISP users.
22. Configure and setup CCTV.

(Note: Additional 52 hours theory and 80 hours practical will be provided during the industrial practice period at training institution)

Reference Books:

1. Computer Network, Author by Andrew S. Tanenbaum
2. Craig Hunt "TCP/IP Network Administration", fourth Edition
3. Roy Blake "Wireless Communication Technology" Delmar Thomson Learning
4. Vikas Gupta "Comdex Hardware & Networking Course Kit" Published bydreamtech press

Graphics and Web Designing

Total Time: 120 hours
Lecture: 30 hours
Practical: 90 hours

Course Description:

This course introduces students to basic of web and graphics design using HTML, CSS, JavaScript and Photoshop. Throughout the course students are introduced to planning and designing effective web and graphics layouts. By the end of this course, students will be able to create quality web pages and websites using a combination of HTML, CSS and JavaScript, and create original graphics design using different tools and features of Photoshop.

Course Objectives:

At the end of the course, student will be able to:

1. Recognize HTML web page elements
2. Plan, design and publish a multi-page website using HTML, CSS, and JavaScript
3. Explain the basic features and tools of Photoshop
4. Create original graphic design using image editing and manipulating techniques

Course Contents:

Theory **30 hrs**

Unit 1: Web **3 hrs**

1.1 Introduction
1.2 Internet
1.3 History of Internet
1.4 World Wide Web
1.5 Webpage, Structure and Components of Webpage, Web pages vs. Websites
1.6 Static vs. Dynamic pages

Unit 2: HTML **5 hrs**

2.1 Introduction, Editors, Basics, Elements, Attributes, Headings, Paragraph, Styles, Formatting, Quotations, Comments, Colors, Anchor, Images, Tables, Lists, Blocks, iframes, Computer code, sub and sup, Symbols, Charset, Entities
2.2 Forms, Form Elements, Form Validations, Input Types, Input Attributes,
2.3 HTML 5, Browser Support, New Elements, Semantics, Migration from HTML 4 to HTML 5, Coding Conventions
2.4 HTML Canvas, HTML SVG

2.5 HTML Multimedia, HTML Video, HTML Audio, HTML Plug-ins, HTML YouTube

Unit 3: CSS **5 hrs**

3.1 Introduction, Syntax, Terminology, and naming conventions, CSS file linking and types, Class, ID, and element selectors, Pseudo selectors, Selectors best practices, CSS comments, Inheritance in CSS

3.2 Colors, Backgrounds, Fonts, Line-height, Text properties, Align, Opacity

3.3 Border, Margin, Padding, Height/Width, Box Model, Outline, Icons, Links, Lists, Tables, Display, Max-width, Position, Overflow, Float, Inline-block

3.4 Responsive design, Mobile friendly and mobile first, Flexible and fluid layouts, Media queries, Testing responsive design, Introduction to CSS Frameworks (Bootstrap, Foundation)

Unit 4: JavaScript **5 hrs**

4.1 Introduction, History of JavaScript, Tools for JavaScript Development, Web Console, JavaScript to HTML

4.2 Variables, Data types, Arithmetic operators and math, Strings and Numbers, Conditional statement and logic, Arrays, Proper and methods in Arrays, Loops, Looping through Arrays, Break and continue loops

4.3 Functions, Arguments and return values, Variable scope, lets and const, Objects, Object constructors

4.4 DOM: The document object model, Target elements in the DOM with query Selector methods, Access and change elements, classes, attributes, Add DOM elements, Add inline CSS to an element

4.5 Events, Type of DOM events, Trigger function with event handlers, Add and use event listeners, Pass arguments via event listeners,

4.6 Terms introduction: jQuery, ajax

Unit 5: Fundamentals of Graphic Design **4 hrs**

5.1 Introduction, Visual elements, Key Principles, Types of Graphic Design

5.2 Visual elements of graphic design: Line, Color, Shape, Texture, Space, Forms, and Typography

5.3 Principle of graphic design: Contrast, Hierarchy, Alignment, Balance, Proximity, Repetition, Simplicity and Function

5.4 Psychological skills to be a graphic designer, Graphic design jobs

5.5 Images, Types of Images: Vector and Raster Graphics, Image file formats

5.6 Color palette, wheel

Unit 6: Photoshop **8 hrs**

6.1 Introduction, History, Opening documents in Photoshop, A tour of interface, Working with multiple document, Panning and zooming, Screen modes, Arranging panels, Switching and saving workspace, Customizing the toolbar, Modifying keyword shortcut for speed

6.2 File formats, Color modes and bit depth, Understanding and changing document size, Image size, Dimension, and Resolution, Multiple undo and history panel, Saving documents

6.3 Layers basics, Loading, selecting, transforming, and aligning, Working with layer group, Merging and flattening layers

6.4 Using text tools

6.5 Crop tool, Straightening a crooked image, Cropping to the perfect size, Increasing canvas size, Auto-fill with Content Aware Crop

6.6 Color basics, Brush options: Healing, Spot healing, Patch, Clone Stamp

6.7 Layer mask essentials, Using gradient to blend images, Using blending options

6.8 Using Marquee and Lasso tools, Combining selections, Quick select and layer mask touchups, Selecting soft edge objects using Select and Mask, Using selection and mask to refine a hard edge selection, Making selection based on color and focus, Paths and Pen tool, Smart objects

6.9 Scaling, Skewing and rotating layer with free transform, Correcting perspective

6.10 Adjustment layer introduction, Histogram, Dynamic range and levels, Local color and contrast with curves, Changing vibrance, hue and saturation, Custom black and white conversion, Limiting adjustments with clipping masks

6.11 Filters overview, Smart filters, Sharpening images, Camera Raw as filter, Filter to multiple layers

6.12 Printing basics, Optimizing images for the web, Using save for web and devices, Creative image slices

PRACTICAL **90 hrs**

Unit 1. Introduction to Web **3 hrs**

1.1 Use Internet

1.2 Create Webpage

Unit 2. HTML **20 hrs**

2.1 Prints your name to the screen in green color with Tahoma font

2.2 Print a paragraph that is description of a book, include the title of the book as well its author. Title and author should be underlined, adjectives and nouns should be italicized and bolded

2.3 Print your name to the screen with every letter being a different heading size

2.4 Print 5 names with a line break between each name. The list should be alphabetized, and to this place subscripted number next to each name based on where it will go in the alphabetized list. (Example: Alan $_1$)

2.5 Create a page with a link at the top of it that when clicked will jump all the way to the bottom of the page. At the bottom of the page there should be a link to jump back to the top of the page.

2.6 Display an image that has a border of size 2, a width of 200, and a height of 200.

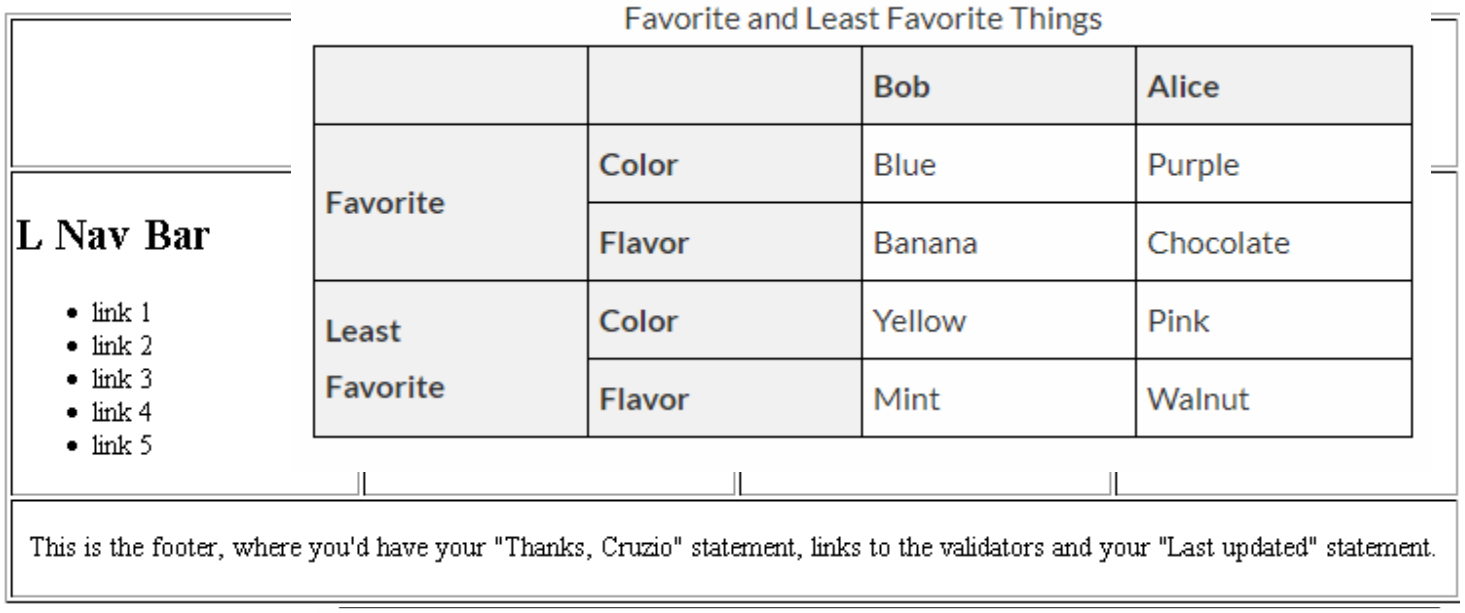
2.7 Create a sing-up page form with two input textas user name and password (password should be of type password), one select as country, one radio button as gender and a submit button.

2.8 Create a contact us page with one text input as name, one input with type email, one text input as subject, one text area as message and a send message button

2.9 Create a table having cell borders to create following output:

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

2.10 Create a table having cell borders to create following output:



Favorite and Least Favorite Things

		Bob	Alice
Favorite	Color	Blue	Purple
	Flavor	Banana	Chocolate
Least Favorite	Color	Yellow	Pink
	Flavor	Mint	Walnut

2.11 Create a table having cell borders to create following output:

2.12 Write a HTML5 code to create a hypertext reference that linksto a page at the location "https://www.googl.com ".Thetext of the links should be“Google.com”

2.13 Create a HTML5 blog post page that includes: <header>, <nav>, <section>, <article>, <embed>, <audio>, <video> and <footer> tag

Unit 3. CSS 20 hrs

3.1 Write a simple HTML5 page with the title “Simple CSS example”. The body of the page should contain a single paragraph with the text “Hello”. The text should have the “color” property set to “green”. An internal style sheet should be used to define an appropriate style that can be applied to the paragraph.

3.2 Create a page with two tags with each div tag put a paragraph. Assign “class” property to first div and “id” property to second div. An external style should be used to change the background color of first div to red using “class” property and change the background color of second div to yellow using “id” property.

3.3 Create a page that has comment system layout as below:
CSS to be applied:

1. “Speak Your Mind” should be have a font size of 20px with font color of orange and aligned left
2. The text area and input should have white background color with 1px border size of color #dddddd. The text area and input size should also have proper margin and padding.
3. The “POST COMMENT” button should have font size of 12 px with font color of orange and aligned right. The button should have white background color and padding of 10px with 2px border size of color orange.

3.4 Design a two column bio-data webpage and apply external CSS.The page should have navigation menu, your profile image, a table to show your education history and use of bullets to list down your skills set.

3.5 Design the landing page of following sites: google.com, facebook.com

3.6 ApplyMedia queries and make the previously made bio-data design responsive in all screen size.

Unit 4. JavaScript 20 hrs

4.1 Write a JavaScript program to get the website URL (loading page).

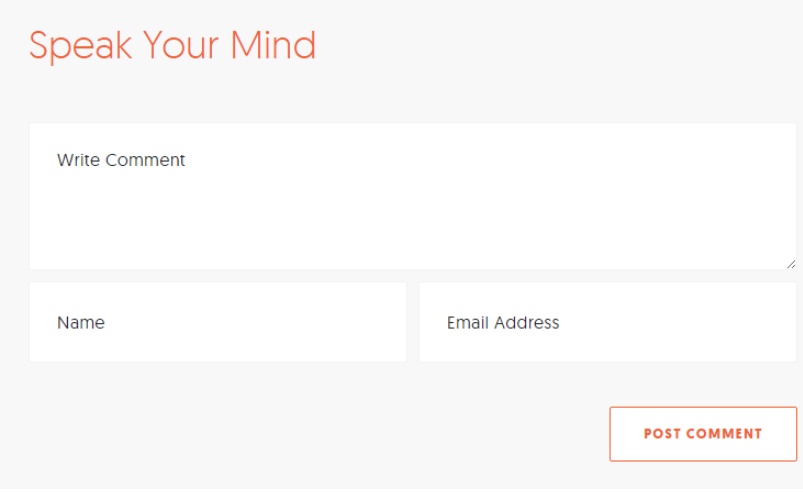
4.2 Write a JavaScript program to compute the sum of the two given integers. If the two values are same, then returns triple their sum.

4.3 Write a JavaScript program to create a new string adding "Py" in front of a given string. If the given string begins with "Py" then return the original string.

4.4 Write a JavaScript program to reverse a given string.

4.5 Write a JavaScript program to convert a given number to hours and minutes.

4.6 Write a JavaScript program to convert temperature to and from Celsius, Fahrenheit.
[Formula: c/5 = (f-32)/9 [where c = temperature in Celsius and f = temperature in Fahrenheit]
Expected Output :



60°C is 140 °F
45°F is 7.222222222222222°C

4.7 Write a JavaScript program to sort all the numbers of a given array into ascending and descending order.

4.8 Write a JavaScript program to compute the sum and product of an array of integers.

4.9 Write a JavaScript function to get a random item from an array.

4.10 Write a JavaScript to get 10 random integer from a range of 1 to 100.

4.11 Write a JavaScript function that reverse a number.

4.12 Write a JavaScript function that checks whether a passed string is palindrome or not?

4.13 Write a JavaScript function that generates all combinations of a string.

4.14 Write a JavaScript function that accepts a string as a parameter and converts the first letter of each word of the string in upper case.

4.15 Write a JavaScript function that accepts a string as a parameter and counts the number of vowels within the string.

4.16 Write a JavaScript function that accepts a string as a parameter and counts the number of vowels within the string.

4.17 Write a JavaScript program to list the properties of a JavaScript object.

Sample object:

```
var student = { name : "David Rayy", sclass : "VI", rollno : 12 };
```

Sample Output:

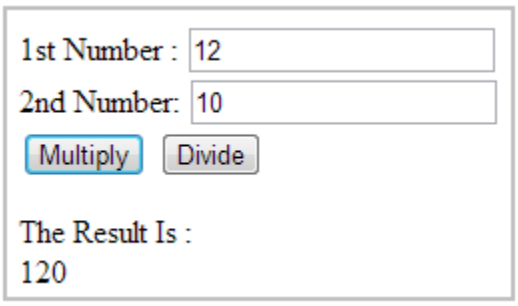
```
name,sclass,rollno
```

4.18 Write a JavaScript program to delete the rollno property from the following object. Also print the object before or after deleting the property.

Sample object:

```
var student = { name : "David Rayy", sclass : "VI", rollno : 12 };
```

4.19 Write a JavaScript program to calculate multiplication and division of two numbers (input from users). Use event listeners to capture the data from value on button click. Add an additional function, calculate the multiplication and division of the two number using the key press so that user doesn't have to click the button.



4.20 Here is a sample html file with a submit button. Now modify the style of the paragraph text through JavaScript code.

```
<!DOCTYPE html>
<html>
<head><meta charset=utf-8 />
    <title>JS DOM paragraph style</title>
</head>
<body>
    <p id ='text'>JavaScript Exercises - w3resource</p>
    <div>
            <button id="jsstyle" onclick="js_style()">Style</button>
    </div>
</body>
</html>
```

Clicking on the button the font, font size, and color of the paragraph text will be changed.

4.21 Here is a sample html file with a submit button. Write a JavaScript function to get the value of the href, hreflang, rel, target, and type attributes of the specified link.

```
<!DOCTYPE html>
<html>
<head>
<meta charset=utf-8 />
</head>
<body>
    <p>
            <a id="w3r" type="text/html" hreflang="en-us" rel="nofollow"
target="_self" href="https://www.google.com/">
                    Google
            </a>
    </p>
    <button onclick="getAttributes()">
            Click here to get attributes value
    </button>
</body>
</html>
```

4.22 Write a JavaScript function to add rows to a table.

4.23 Write a JavaScript function to remove items from a dropdown list.

4.24 Create an Analog clock that make clock move forward second by second

4.25 Debugging Errors in JS

Unit 5. Fundamentals of Graphic Design **2 hrs**

5.1 Assignment: Visual elements, Principle of Graphic Design

Unit 6. Photoshop **25 hrs**

6.1 Remove Background/unwanted content
6.2 Create Clipping Mask
6.3 Blend images and create a composite image
6.4 Crop and straighten image
6.5 Improve lighting and color
6.6 Repair and colorize old photos
6.7 Smooth skin and remove blemishes and scars
6.8 Convert black and white image onto color image
6.9 Add creative effects using layer mask
6.10 Create light effects using filters
6.11 Remove red eye for a photo
6.12 Create a photo frame
6.13 Create a three page brochure design
6.14 Create a logo, t-shirt, business card, letter-pad, and cup design for a company
6.15 Create a banner of an event
6.16 Create a 404 error page design
6.17 Create a web layout design

(Note: Additional 52 hours theory and 80 hours practical will be provided during the industrial practice period at training institution)

Reference:

1. Craig Grannell, The Essential Guide to CSS and HTML Web Design
2. Elisabeth Robson and Eric Freeman, Head First HTML and CSS
3. Paul Wilton, Jeremy McPeak, Beginning JavaScript
4. Elisabeth Robson and Eric Freeman, Head First JavaScript Programming
5. David Dabner and Sandra Stewart, Graphic Design School: A foundation course for Graphic Designers
6. Carolyn Knight and Jessica Glaser, The Graphic Design exercise book: Creative briefs to enhance your skills and develop your portfolio
7. The official training workbook from Adobe, Adobe Light room CC and Photoshop CC for Photographers Classroom in a Book, 1st Edition

Entrepreneurship Development

Total Time: 78 hours
Theory: 30 hours
Practical: 48 hours

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. Define business and entrepreneurship
2. Explore entrepreneurial competencies
3. Analyze business ideas and viability
4. Formulate business plan
5. Learn to manage small business

Course Contents:

S. N.	Task statements	Related technical knowledge	Time (hrs)		
			T	P	Tot
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

S. N.	Task statements	Related technical knowledge	Time (hrs)		
			T	P	Tot
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 • Barriers to creative thinking	1.67	0.33	2.0
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	1.5	1.0	2.5

S. N.	Task statements	Related technical knowledge	Time (hrs)		
			T	P	Tot
		• Do and don't do while taking risk			
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 • Marketing strategies	1.33	0.75	2.08
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

S. N.	Task statements	Related technical knowledge	Time (hrs)		
			T	P	Tot
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 plan/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 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	2.0	13.0	15.0
23	Appraise business plan	**Business plan appraisal:** • Return on investment • Breakeven analysis • Cash flow	0.5	5.5	6.0

S. N.	Task statements	Related technical knowledge	Time (hrs)		
			T	P	Tot
		• Risk factors			
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.

Industrial Practices

Description:
The training institute will make arrangement for apprenticeship. Admitted trainees will have the three parties training agreement among trainees, sponsoring industries and training institute. The Agreement terms and conditions will be implemented during the whole training period.

The proposed apprentice students have three and half months (15 weeks) theoretical and practical classes in the training institute. After completing the 15 weeks training in training institute, students will be placed in industries working in IT sectors as an apprentice under the supervision of In-company Trainer, where as industrial practice & related skills will be learned. The nature of the training is practical works and the duration will be of approximately 18 months (78 weeks/3120 hours). Students will work in the related sponsoring industries for 5 days a week and come to the training institute 1 day per week.

Students will work in all three areas for first 36 weeks as mentioned in the structure of this curriculum. Remaining 42 weeks industrial practice will be specialized in any one or all area as per the need of industry and interest of the trainees. Counselling classes will be organized by the training institution prior to take the decision of specialization. Assignments and skills to be performed during the industrial practice period are given below in this curriculum.

General objectives:
The objective of the apprenticeship is to make students familiar with/gain firsthand experience of the world of work as well as to provide them an opportunity to acquire skills that are theoretically learnt in the institute.

Complete Apprenticeship plan

S. N.	Activities	Duration	Remarks
1	Orientation	Two days	Before Apprenticeship
2	Report to the site	One day	Before placement
3	Actual work at site	78 weeks	During apprenticeship
4	Evaluation by the sponsoring industries		Regular
6	Evaluation by the training Institute		At least one time in every three months
7	Final evaluation		Last month of the apprenticeship programme by the Industries
6	Final report preparation and presentation	5 days	After completion of apprenticeship

Note:

- Students should maintain the daily diary during the apprenticeship programme.
- Students should prepare the apprenticeship report and present in training institution in the presence of In-company Trainer.
- Evaluation of apprenticeship programme should be done by the In-company Trainer (Industrial Supervisor).

Hardware Assembly, Repair and Maintenance

S. N.	Assignments	Skills
2.	Perform computer assembly	- Identify different computer components - Assemble different computer parts
3.	Setup already assembled computers	- Manage disk partition - Install Operating systems - Install utility and application tools
4.	Setup Laptops	- Manage disk partition - Install OS - Install utility and application tools
5.	Encrypt disks	- Use disk encryption tools - Encrypt disk - Decrypt Disks
6.	Setup printer	- Join pointer to the CPU - Install printer driver
7.	Change printer toner	- Inspect toner usage - Change toner
8.	Setup Scanner	- Join Scanner to the CPU - Install Scanner driver
9.	Setup projector	- Join projector to Computer or Laptop - Use VGA / HDMI cards - Switch displays - Setup projector configurations
10.	Perform file transfer	- Use CD ROM - Use Flash disks
11.	Disk backup and recovery	- Perform backup of data - Perform data recovery
12.	Perform Security related tasks	- Setup antivirus tools - Perform virus scanning - Act based on scan results
13.	Perform Software updates	- Setup update frequency
14.	Perform computer / laptop dusting	- Use blowers to cleanup
15.	Diagnose power and connectivity issues	- Use multimeter and ammeter
16.	Perform Mobile related tasks	- Mobile security - Transfer data - Backup mobile data - Factory reset mobile - Perform Bluetooth based operations - Connect to internet using WiFi and Mobile Data
17.	Dispose computer parts	- Disposal techniques - Destroy data

Networking

S.N.	Assignments	Skills
2.	Perform network wiring using RJ45	- Wiring network cables - Setup RJ45 connectors - Join computes using RH45
3.	Perform optical fiber-based connection	- Setup optical fibers - Join different points using optical fibers
4.	Setup LAN in Windows based environment	- Assign IP addresses - Add in workgroups
5.	Setup LAN in Windows based environment	- Assign IP addresses - Add in workgroups
6.	Join Computers in Active Directory	- Join in windows-based AD - Join in Linux based AD
7.	Setup network printers	- Join printer in network - Setup the sharing mode of printer across LAN
8.	Setup Internet	- Provide appropriate IP - Provide appropriate Gateway
9.	Perform file sharing	- Create shared folders - Manage accesses
10.	Setup wireless network	- Setup Wireless routers - Setup access points - Manage users' access - Changing wireless access keys
11.	Host a web application	- Setup web server (tomcat) - Get account from DNS provider - Host website in that DNS
12.	Perform network security scans	- Install security tools - Perform network scans - Prepare reports
13.	Perform Intercom over phone line	- Setup intercom - Connect phone lines over intercom - Provide intercom numbers
14.	Perform ISP based users support tasks	- Troubleshoot connectivity issues - Troubleshoot perform issues - Handle connection between access points to the home users - Limit bandwidth to users - Setup routers
15.	Perform CCTV setup	- Install CCTV hardware - Install CCTV software - Manager CCTV storage

Web and Graphics Design

S.N.	Assignments	Skills
1.	Observe webpages and websites	- Identify the structure and components of webpages and websites - Understand the HTLM, CSS, JavaScript codes used to build them webpages and websites - Understand the web design layout
2.	Design forms and tables using HTML and CSS	- Collect the required information - Submit the layout of form and tables - Write codes to build forms and tables
3.	Design a carousel using	- Write codes to create a carousel image slideshow
4.	Design multi-level navigation menu	- Write codes to create a multi-level navigation menu
5.	Design login, logout, and contact page	- Design web layouts - Write codes to create login, logout and contact page - Apply style sheet to beautify the pages
6.	Design Error pages	- Collect and identify the requirements - Write codes to design error pages - Apply style sheet to beautify the pages
7.	Form validation using HTML	- Collect and identify the requirements - Write codes to perform form validations
8.	Embed Google Maps, YouTube videos	- Write codes to add Google Maps, YouTube videos to a webpage
9.	Design a webpage using HTML and CSS	- Collect or identify the requirements - Construct and validate the web design layout - Write codes to build a webpage using external CSS style sheet
10.	Design a website using HTML, CSS and JavaScript	- Collect or identify the requirements - Construct and validate the web design layout - Write codes to build a multipage website using external CSS style sheet and JavaScript
11.	Design a responsive website	- Collect or identify the requirements - Construct and validate the responsive web design layout - Write CSS media queries to design a responsive website for mobile and tablets
12.	Form Validation using JavaScript	- Collect and identify the requirements - Write codes to perform form validations using JavaScript
13.	Create a pop-up email subscription box	- Construct and design the layout of email-subscription box

		- Write codes to create a pop-up email subscription box using HTML, CSS and JavaScript
14.	Arithmetic and String manipulation using JavaScript	- Collect or identify the requirements - Construct the workflow of logic for manipulation - Write codes to perform arithmetic and string manipulation operations
15.	Create page loading animation	- Write codes to create a page loading animation using HTML, CSS and JavaScript
16.	Fix web design bugs and issues	- Identify the web design and bugs of webpages and websites - Construct and validate the fixes codes - Write codes to fix the web design bugs and issues
17.	Observe logos, banners and several other graphic design layouts	- Identify the visual element graphic design - Identify the basic principles of graphic design
18.	Design a ID Card	- Collect or identify the requirements - Sketch the layout design of ID Card - Validate the layout design - Design the ID Card using Photoshop
19.	Design a logo	- Collect or identify the requirements - Sketch the design of logo - Validate the design - Design the logo using Photoshop
20.	Create multiple event banners	- Collect or identify the requirements of event - Sketch the layout design of banners - Validate the design - Design the banners using Photoshop
21.	Create icon sets	- Collect or identify the requirements - Sketch the design of icon sets - Validate the design - Design the icon sets using Photoshop
22.	Create festive day banners	- Collect or identify the requirements - Sketch the layout design of festive day - Validate the design - Design the banners using Photoshop
23.	Create a T-shirt design	- Collect or identify the requirements - Sketch the design of T-shirt - Validate the design - Design the T-shirt using Photoshop
24.	Create one page brochure	- Collect or identify the requirements - Sketch the layout design of brochure - Validate the design - Design the brochure using Photoshop

25.	Create a three page brochure	- Collect or identify the requirements - Sketch the layout design of three page brochure - Validate the design - Design the three page brochureusing Photoshop
26.	Design business card and letter pad	- Collect or identify the requirements - Sketch the layout design ofbusiness card and letter pad - Validate the design - Design the business card and letter padusing Photoshop
27.	Design web page components: login, logout, navigation menu, pagination, contact form and comment system	- Collect or identify the requirements - Sketch the layout design ofweb page components - Validate the design - Design the web page components using Photoshop
28.	Design a single web page	- Collect or identify the requirements - Sketch the layout design of web page - Validate the design and alignments - Design the web page using Photoshop
29.	Design a multi-page website	- Collect or identify the requirements - Sketch the layout design of web site - Validate the web site and alignments - Design the web site using Photoshop

Curriculum Development Expert Team:

1. Surendra Nath Adhikari, Campus chief, Dearwalk Information Technology Collage, Siphal
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