

CURRICULUM
TSLC
Computer Engineering
(Post-SLC Intake Program)



Council for Technical Education and Vocational Training
Curriculum Development Division

Sanothimi, Bhaktapur

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Introduction

This “Curriculum for TSLC in Computer Engineering” is designed to produce competent workforce equipped with skills, knowledge and attitudes in the field of computer engineering. Graduates of this program will be capable to provide services in the growing information and communication field and development industries, government institutions, local as well as international non-governmental organisations. They also can start their own business.

Aims

The program aims is preparing competent basic level workforce in the field of computer engineering.

Objectives

After completing this curricular program, the graduates will be able to:

- help to uplift the awareness about the ICT;
- work in the fast growing field of ICT industries, government institutions, local as well as international and non-governmental organisations;
- process the related data;
- 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 course is designed to prepare competent workforce especially, in the field of computer engineering and information and communication technology (ICT), in order to work in the field of IT in Nepal, especially in the fast growing ICT industries, government institutions, local as well as international non-governmental organisations or can start their own service centres.

Course Duration

This course is completed within 15 months (12 months on institution + 3 months on the job training (OJT). The duration is 52 weeks/1560 hours for each year on institution and 12 weeks/480 hours on-the-job assignment for issuing successful completion of the course.

Target group

The target group for this pre SLC intake curricular program is all the interested individuals of the country who have SLC passed.

Target location

The target location of this program will be all over Nepal.

Medium of Instruction

The medium of instruction for this training program will be Nepali or English or both.

Pattern of Attendance

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

Group size

The group size of this program is not more than 40.

Entry Criteria

Individuals who meet the following criteria are allowed to enter into this program:

- SLC pass
- Students should pass entrance examination administered by CTEVT

Focus of the Program

This is a competency based curricular program. This program emphasizes on competent performance of the task specified in it. In this programme, 80% time is allotted to the competencies and remaining is allotted to the related technical knowledge. Therefore, this curriculum is designed focussing on the performance of the specified competencies/tasks /skills included in this program.

Teacher and Student Ratio

- 1:10 for practical classes
- Depends on the nature of subject matter and class room situation for theory classes.
- Minimum of 75% of the teachers must be fulltime.

Instructors' Qualification

- Bachelors in related field or equivalent.

- Good communicative & instructional skills.
- Experience in the related field.

Instructional Media and Materials

The following instructional media and materials are suggested for the effective instruction and demonstration.

- Printed Media Materials (Assignment sheets, Case studies, Handouts, Information sheets, Individual training packets, Procedure sheets, Performance Check lists, Textbooks etc.).
- Non-projected Media Materials (Display, Models, Photographs, Flip chart, Poster, Writing board etc.).
- Projected Media Materials (Opaque projections, Overhead transparencies, Slides etc.).
- Audio-Visual Materials (Audiotapes, Films, Slide-tape programs, Videodiscs, Videotapes etc.).
- Computer-Based Instructional Materials (Computer-based training, Interactive video etc.).

Teaching Learning Methodologies

The methods of teachings for this curricular program will be a combination of several approaches such as illustrated lecture, group discussion, demonstration, simulation, guided practice, practical experiences, fieldwork, report writing, tutoring, role-playing, heuristic and other independent learning.

- Theory: lecture, discussion, assignment, group work.
- Practical: demonstration, observation, guided practice and Self-practice.
- On the Job Training (OJT)

Evaluation Details

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

- There should be three internal assessments within course duration.
- 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.
- Related technical knowledge learnt by students will be evaluated through written tests.
- 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.

- Students should pass internal assessments both in theory and practical tests in all subjects.
- The ratio between the theory and practical tests will be 20:80 in case of a practical nature subject.
- The on-the-job training has to be evaluated keeping 300 as full marks. The evaluation of the performance of the student is to be carried out by the three agencies; the concerned institute, industry/organization where the student worked and the CTEVT office of the controller of examinations. Here, also the student has to score 60% or above for successful completion of the course.

Grading System

The grading system will be as follows:

| <u>Grading</u> | <u>Overall Marks</u> |
|-----------------------|-----------------------------|
| 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 students who successfully complete all the requirements as prescribed by the curriculum.

Career Path

The graduates will be eligible to work in the position of computer operator in the government related organizations as prescribed by the Public Service Commission or the concerned authorities of the Republic of Nepal

Curriculum Structure of TSLC in Computer Engineering

| S. N. | Course Title | Nature | Class / Week | Total Class/Year | | | Full Marks | | |
|----------|---------------------------------------|--------|--------------|------------------|-----|-------------|------------|------------|-------------|
| | | | Total | 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 | 65 | 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 | | | 78 | 0 | 50 | 50 |
| | Sub Total | | 40 | | | 1560 | 210 | 790 | 1000 |
| | On-the-Job Training | | | | | 480 | | | 300 |
| | Total | | | | | 2040 | | | 1300 |

T: Theory
P: Practical

Subjects

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 <ul style="list-style-type: none"> ◆ Identify Computer components | <ul style="list-style-type: none"> ◆ Concept of information technology ◆ Importance and use of information technology Computer <ul style="list-style-type: none"> ◆ Introduction ◆ Characteristics ◆ History ◆ Use and advantage ◆ Generation & their features ◆ Classification ◆ Block diagram ◆ Computer System & components <ul style="list-style-type: none"> ◆ Input units ◆ Processing units ◆ Output units ◆ Memory and storage units ◆ Computer peripherals and | 26 | 1 | 27 |

| | | | | | |
|---|---|--|---|----|------|
| | | its functions Hardware and software ♦ Introduction ♦ Types | | | |
| 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 | ♦ Desktop Components ♦ Pixel and resolution ♦ Use of relevant shortcut keys | 1 | 6 | 7 |

| | | | | | |
|---|---|--|---|---|----|
| | <ul style="list-style-type: none"> ◆ 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 | | | | |
| 5 | Operate Window Applications <ul style="list-style-type: none"> ◆ Apply paint ◆ Use calculator ◆ Use WordPad ◆ Use character map ◆ Apply sound recorder ◆ Use Window media player | Window Applications <ul style="list-style-type: none"> ◆ Introduction to Paintbrush, Calculator, Imaging, Notepad, WordPad, character map, Multimedia, media files | 1 | 4 | 5 |
| 6 | Work with file/ Folder <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> ◆ 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 | <p>Manipulate control panel</p> <ul style="list-style-type: none"> ◆ 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 | <p>Control Panel</p> <ul style="list-style-type: none"> ◆ 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, | 1 | 2 | 3 |
| 8 | <p>Maintain & optimize computer</p> <ul style="list-style-type: none"> ◆ 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 | <p>Maintain & optimize computer</p> <ul style="list-style-type: none"> ◆ Introduction to system tools ◆ Importance of windows update and firewall ◆ Computer Virus <ul style="list-style-type: none"> ◆ 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 | 2 ½ | 8 | 10 ½ |

| | | | | | |
|------------------|--|--|-----------|-----------|-----------|
| | <ul style="list-style-type: none"> account properties ♦ Apply security, permission and group policies ♦ 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 <ul style="list-style-type: none"> ♦ 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 | <ul style="list-style-type: none"> ♦ 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 <ul style="list-style-type: none"> ♦ 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 | <ul style="list-style-type: none"> ♦ Concept of text, paragraph, graphics, charts, objects in documents ♦ Use of relevant shortcut keys | 2 | 9 | 11 |

| | | | | | |
|----|--|---|-----|----|-----|
| | <p>setting, bullets and numbering, symbols, format painter, clear formatting, apply word count, use thesaurus</p> <ul style="list-style-type: none"> ◆ 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 | | | | |
| 3. | <p>Format document</p> <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ 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. | <p>Work with table</p> <ul style="list-style-type: none"> ◆ 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 & | <ul style="list-style-type: none"> ◆ Concept of cell, row, column, table and its properties ◆ Use of relevant shortcut keys | 1 ½ | 6 | 7 ½ |

| | | | | | |
|------------------|--|--|-----------|-----------|-----------|
| | <ul style="list-style-type: none"> align text ◆ Show/hide gridlines ◆ Convert text to table or vice versa ◆ Sort the contents of a table ◆ Repeat table headings ◆ Apply formula | | | | |
| 5 | View document <ul style="list-style-type: none"> ◆ Apply/remove outline view ◆ Apply/Remove print layout view ◆ Show/Hide rulers and thumbnails ◆ Zoom documents ◆ Arrange window ◆ Split window ◆ Remove split | <ul style="list-style-type: none"> ◆ Use of different view and windows ◆ Use of relevant shortcut keys | ½ | 2 | 2 ½ |
| 6. | Print document <ul style="list-style-type: none"> ◆ Preview document ◆ Print Document (All, current page, Pages, selected text, Even page, odd page & no of copies) ◆ Adjust print properties/preference | <ul style="list-style-type: none"> ◆ Printer and printer properties ◆ Use of relevant shortcut keys | ½ | 2 | 2 ½ |
| 7 | Customize Ms-Word <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Use of word option | 1 | 2 | 3 |
| 9 | 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 <ul style="list-style-type: none"> ◆ Identify Ms Excel components ◆ Start Ms Excel ◆ Exit Ms Excel ◆ Create Workbook ◆ Open Workbook ◆ Save/As Workbook ◆ Close Workbook ◆ Protect Workbook | <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> ◆ 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 & shading, fill), lock/protect cell/worksheet, clear formats ◆ Find and replace, merge cell ◆ Apply cell styles, table format | <ul style="list-style-type: none"> ◆ Introduction to cell, row, column, worksheet ◆ Paste and paste special ◆ Advantage of protecting cells/sheet/workbook ◆ Use of relevant shortcut keys | 1 | 6 | 7 |
| 3. | Manipulate data <ul style="list-style-type: none"> ◆ Fill data ◆ Apply flash fill ◆ Sort data ◆ Filter data including advance filter ◆ Apply data | <ul style="list-style-type: none"> ◆ Use of Filter ◆ Introduction to data validation & conditional formatting ◆ Use of data validation & conditional formatting ◆ Pivot table, chart and | 3 | 8 | 11 |

| | | | | | |
|----|---|---|-----|----|------|
| | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> macro ◆ Data consolidate and what if analysis ◆ Use of relevant shortcut keys | | | |
| 4. | <p>View workbook</p> <ul style="list-style-type: none"> ◆ Apply/remove workbook views ◆ Show/hide grid lines, formula bar, heading ◆ Zoom worksheet ◆ Arrange, split window, freeze panes | <ul style="list-style-type: none"> ◆ Use of Different workbook views | 1 | 2 | 3 |
| 5. | <p>Setup page layout and print workbook</p> <ul style="list-style-type: none"> ◆ 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 worksheet ◆ Adjust print properties | <ul style="list-style-type: none"> ◆ Printer and printer driver | 1 | 2 | 3 |
| 6. | <p>Work with formula and function</p> <ul style="list-style-type: none"> ◆ Apply function/formula ◆ Insert Date & time ◆ Apply Sum, Product, Average, Maximum, Minimum, Rank, Division, Subtract, Power) ◆ Concatenate | <ul style="list-style-type: none"> ◆ 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) | 2 ½ | 11 | 11 ½ |

| | | | | | |
|------------------|--|---|-----------|-----------|-----------|
| | <ul style="list-style-type: none"> ◆ Text/String ◆ Count Data ◆ Apply Lower, Upper & Proper Function ◆ Apply IF and nested IF function ◆ Simple text, math and lookup function ◆ Apply name | <ul style="list-style-type: none"> ◆ 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 | | | |
| 7. | Present data <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> ◆ Identify Ms PowerPoint Component ◆ Start Ms PowerPoint ◆ Exit Ms PowerPoint ◆ Create Presentation ◆ Open Presentation ◆ Save Presentation ◆ Close Presentation ◆ Protect Presentation ◆ Publish Presentation | <ul style="list-style-type: none"> ◆ Introduction to presentation program ◆ Introduction to Ms PowerPoint and its component ◆ Default extension and location ◆ Different file types | 1 ½ | 2 | 3 ½ |
| 2. | Format slide and presentation <ul style="list-style-type: none"> ◆ Insert Slide ◆ Remove Slide ◆ Duplicate Slide ◆ Apply/Modify Themes (Fonts, | <ul style="list-style-type: none"> ◆ Themes, Effects & Template ◆ Header & Footer ◆ Define master slide ◆ Use of master slide ◆ Use of relevant shortcut keys | 1 ½ | 4 | 5 ½ |

| | | | | | |
|----|--|---|---|---|-----|
| | <p>Color, Effects)</p> <ul style="list-style-type: none"> ◆ 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 | | | | |
| 3. | <p>Add/Modify Objects</p> <ul style="list-style-type: none"> ◆ 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 & text wrapping ◆ Rotate Picture/Clipart ◆ Insert caption ◆ Insert file/object, symbols | <ul style="list-style-type: none"> ◆ Concept of clipart, chart, smart art, word art, action button, sound and movie ◆ Use of relevant shortcut keys | 1 | 2 | 3 |
| 4. | <p>Apply Animation Effects</p> <ul style="list-style-type: none"> ◆ Apply Custom Animation (Entrance, Emphasis, Exit & Motion Path) ◆ Remove/Modify Animation Effects | <ul style="list-style-type: none"> ◆ Use of animation ◆ Use of slide transition ◆ Use of relevant shortcut keys | ½ | 4 | 4 ½ |

| | | | | | |
|------------------|--|--|----------|-----------|-----------|
| | <ul style="list-style-type: none"> ◆ Adjust Animation (Start, Property & Speed) ◆ Adjust Effect Option, Timing & Text animation ◆ Apply Slide Transitions ◆ Remove/Modify Slide Transitions ◆ Adjust Transition Sound, Speed, Manual/Automatic | | | | |
| 5. | Perform slide show <ul style="list-style-type: none"> ◆ Show presentation from beginning ◆ Show presentation from current slide ◆ Show/Hide Slide ◆ Perform Slide setup | <ul style="list-style-type: none"> ◆ Slideshow ◆ Use of relevant shortcut keys | ½ | 2 | 2 ½ |
| 6. | View presentation <ul style="list-style-type: none"> ◆ 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 ◆ Arrange window ◆ Split window ◆ Add/Run macros | <ul style="list-style-type: none"> ◆ Use of Different views ◆ Use of macros ◆ Use of relevant shortcut keys | ½ | 1 | 1 ½ |
| 7. | Print presentation <ul style="list-style-type: none"> ◆ Preview Presentation ◆ Print Presentation (Current Slide, Slides & no of copies) ◆ Print Handout & Notes | <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> • Check Internet Connection • Open web browser • Adjust web browser • Open/browse website • Search information on the web • Clear history | <ul style="list-style-type: none"> ♦ 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 <ul style="list-style-type: none"> • Create new email account • Compose mail • Send email • Attach a file • Reply email • Forward email • Delete email • Manage/use address book • Print email • Change password | <ul style="list-style-type: none"> ♦ Define email ♦ Advantages/use of email. ♦ Free email service ♦ Compose, Inbox, attach files, Sent item, Trash, Reply, Forward, CC, BCC. ♦ Address book ♦ SPAM, Junk mail ♦ Concept of compressing files/folders | 2 | 7 | 9 |
| 3. | Familiarize with Outlook <ul style="list-style-type: none"> • Open Outlook • Identify outlook components • Configure outlook express • Compose mail • Send email • Attach a file | <ul style="list-style-type: none"> ♦ Concept of Outlook Express ♦ Use of POP, SMTP, IMAP | 1 | 6 | 7 |

| | | | | | |
|------------------|--|---|----------|-----------|-----------|
| | <ul style="list-style-type: none"> • Reply email • Forward email • Delete email • Manage/use address book • Print email • Backup contact and email | | | | |
| 3. | <ul style="list-style-type: none"> ◆ Download necessary information/software from the net | <ul style="list-style-type: none"> ◆ Concept of upload and download ◆ Download accelerator, Concept of freeware, shareware ◆ File sharing sites | ½ | 2 | 2 ½ |
| 4. | <ul style="list-style-type: none"> ◆ Use Instant Messaging Service (IMS) ◆ Share information through social networking sites | <ul style="list-style-type: none"> ◆ Useful websites including social networking sites, IMS , video conference ◆ Concept of firewall | ½ | 1 | 1 ½ |
| 5. | <ul style="list-style-type: none"> ◆ Scan email ◆ Protect computer from virus and spywares | <ul style="list-style-type: none"> ◆ 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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- V. Rajaraman, Neeharika Adabala (2014). Fundamentals of Computers 6th Edition. New Delhi: PHI
- Cox, J., Lambert, J., & Frye, C. (2011). *Microsoft Office Professional 2010 step by step*. Redmond, Wash: Microsoft.
- Melton, B. (Ed.). (2013). *Microsoft Office Professional 2013*. Sebastopol, Calif: O'Reilly Media.
- Microsoft Office Professional 2013, Eastern Economic Edition, Tata McGraw-Hill

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) | | |
|-------|--|----------------------------|-----------------|------|-------|
| | | | THEORY | PRAC | 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 | ♦ Fonts | ½ | 2 | 2½ |

| | | | | | |
|------------------|---|---|----------|-----------|-----------|
| | dictionary ♦ Lead and Track | | | | |
| 6. | Handle Paragraph Attributes ♦ Perform Justification, Alignment, Force Justify, Tab, Indent, Hanging | | | 1 | 1 |
| 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 header 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 <ul style="list-style-type: none"> ◆ The toolbox ◆ Save Images in Photoshop, Format and navigate | <ul style="list-style-type: none"> ◆ The Photoshop Window ◆ Raster and Vector Graphics | 1 | 2 | 3 |
| 2. | Manipulate images <ul style="list-style-type: none"> ◆ Image, Size Resolution, Cropping | | ½ | 2 | 2½ |
| 3. | Select Image Areas <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Mode Characteristics, Colour Modes, Greyscale and Bitmap Modes | 1 | 2 | 3 |
| 6. | Select Colour <ul style="list-style-type: none"> ◆ Use Colour Palette, Picker, Info Palette, Rearrange Palettes and Eyedropper Tool | <ul style="list-style-type: none"> ◆ Concept of Colour Palette | 1 | 2 | 3 |
| 7. | Paint in Colour <ul style="list-style-type: none"> ◆ Tools: Line Tool, Paintbrush Tool, Pencil Tool, Rubber Stamp Tool and Paint Selection Masks | | ½ | 2 | 2½ |
| 8. | Create/Manipulate layers <ul style="list-style-type: none"> ◆ Paint with Layers | <ul style="list-style-type: none"> ◆ Concept of layer and its uses | 1 | 2 | 3 |
| 9. | Adjust Images <ul style="list-style-type: none"> ◆ Adjust | | | 2 | 2 |

| | | | | | |
|------------------|--|--|--|----------|-----------|
| | Brightness/Contrast, Levels Adjustment layers, Toning Tools and Hue/Saturation | | | | |
| 10. | Save Completed Images ♦ Flatter Images and Saving processes | | | 2 | 2 |
| 11. | Project work | | | 6 | 6 |
| Sub-Total | | | | 6 | 26 |
| | | | | 6 | 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 | Introduction to bitmap compression | ½ | 2 | 2½ |

| | | | | | |
|------------------|--|--|----------|-----------|-----------|
| | <ul style="list-style-type: none"> ◆ Tween bitmap effects ◆ Test the movie | | | | |
| 8 | Load dynamic text at runtime <ul style="list-style-type: none"> ◆ 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 |
| 9. | Add animation and navigation to buttons <ul style="list-style-type: none"> ◆ Import the library of another FLA file ◆ Align buttons ◆ Enable simple buttons ◆ Modify a button state ◆ Add actions to buttons ◆ Add button navigation | <ul style="list-style-type: none"> ◆ Introduction to library with its uses | 1 | 2 | 3 |
| 10 | Add streaming and event sounds <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> ◆ Create HTML Document, Tags, Skeleton & flesh ◆ Text ◆ Images and types ◆ Lists and forms ◆ Tables ◆ Frames | <ul style="list-style-type: none"> ◆ Introduction of HTML ◆ Role, history, versions of HTML. ◆ Types of Tags ◆ Attributes and its properties | 2 | 4 | 6 |
| 2. | Create Links/ Webs <ul style="list-style-type: none"> ◆ Hypertext basics ◆ Reference documents and its linking | | | 2 | 2 |
| 3. | Design/Manipulate forms | <ul style="list-style-type: none"> ◆ Concept of form | 1 | 2 | 3 |

| | | | | | |
|------------------|--|---|-----------|-----------|-----------|
| | <ul style="list-style-type: none"> ◆ Multi line text areas ◆ Multiple choice elements | ◆ Elements of form | | | |
| 4. | Design Tables <ul style="list-style-type: none"> ◆ Create Tables ◆ Format Tables | <ul style="list-style-type: none"> ◆ Concept of Table and its usage ◆ Table models, definition and types ◆ | 1 | 3 | 4 |
| 5. | Design Frames <ul style="list-style-type: none"> ◆ Create frame and frameset | ◆ Overview | 1 | 2 | 3 |
| 6. | Create hyperlinks with text and image <ul style="list-style-type: none"> ◆ Hyperlinks ◆ Text and image | Introduction and types of hyperlink | 1 | 2 | 3 |
| 7 | Style sheet <ul style="list-style-type: none"> ◆ Create and Implement CSS | <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Introduction to Dreamweaver and workspace ◆ Introduction to launcher and toolbars | 2 | 5 | 7 |
| 2. | Manage Site <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> ◆ Create and save documents ◆ Insert images with assets panel | Webpage Introduction to webpage | 1 | 5 | 6 |

| | | | | | |
|------------------|--|---|----------|-----------|-----------|
| | <ul style="list-style-type: none"> ◆ 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 ◆ Align text ◆ Use html lists ◆ Use color schemes ◆ Use text in tables | | | | |
| 4. | Insert links <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Introduction and types of link ◆ Concept of anchor | 1 | 4 | 5 |
| 5. | Insert tables and Flash objects <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> ◆ Insert form objects ◆ Create a form ◆ Create a jump menu | Concept of forms | 1 | 4 | 5 |
| 7 | Use Codes <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> ◆ Set server environment ◆ Install XAMPP ◆ Run PHP Scripts ◆ Format Outputs ◆ Work with Variables, 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 | <ul style="list-style-type: none"> ◆ Introduction to Scripting, Client Side scripting ◆ Introduction to PHP ◆ Concatenation ◆ Operators and its types ◆ Conditional Statements, Iteration ◆ Looping ◆ Code Escape Sequences | 5 | 8 | 13 |
| 2. | Access Mysql database <ul style="list-style-type: none"> ◆ 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) | <ul style="list-style-type: none"> ◆ Introduction to phpMyAdmin ◆ Introduction to Database ◆ Introduction to SQL and Type of Join | 4 | 7 | 11 |
| 3. | Manage Session and Cookie <ul style="list-style-type: none"> ◆ Work on Password encryption and decryption, Emailing links to change Password ◆ Manage Session ◆ Preventing unauthorized access | <ul style="list-style-type: none"> ◆ Introduction to Session and Cookie with its usage | 5 | 7 | 12 |

| | | | | | |
|------------------|--|--|-----------|-----------|-----------|
| | <ul style="list-style-type: none"> ◆ Work on Session destroy function ◆ Manage Cookie | | | | |
| 4. | Integrate jQuery and AJAX <ul style="list-style-type: none"> ◆ Integrating jQuery Slider, rotater ◆ Use jQuery Tabs and accordion. ◆ Use Dynamic jQuery Slider ◆ Use Advanced jQuery effects ◆ Use XMLHttpRequest Object ◆ Fetch data asynchronously from database | <ul style="list-style-type: none"> ◆ Concept of AJAX and jQuery | 4 | 5 | 9 |
| 5. | Project Work & Presentation | | | 10 | 10 |
| Sub-Total | | | 18 | 37 | 55 |

References:

- 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 | <ul style="list-style-type: none"> ♦ 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 | <ul style="list-style-type: none"> ♦ 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 | 5 | | |

| | | | | | |
|------------------|--|---|-----------|--|-----------|
| | | models by degree of abstraction | | | |
| 3 | Conceptualize Design using the Relational Database Model (RDBMS) | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ 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) | | |
|-------|---|--|-----------------|-------|-------|
| | | | THEORY | PRAC. | TOTAL |
| 1. | <ul style="list-style-type: none"> Start MS Access Open database and save it. Create table in design view, wizard, datasheet view. Exit Data base. | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Move the field order. Customize data to be entered. Apply validation rule. Use primary key field in the data table. | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Use different formula by | <ul style="list-style-type: none"> Give the introduction of | 2 | 10 | 12 |

| | | | | | |
|---|--|--|---|---|----|
| | <p>using query in table and calculate.</p> <ul style="list-style-type: none"> • Create query in design view. • Switch between runtime and design view. • Create APPEND, SELECT, MAKE TABLE, DELETE query. • Switch between runtime and design view. | <p>the objects used in MS Access like forms, query, and reports.</p> <ul style="list-style-type: none"> • Using various types of queries. • Calculating the fields using update query. • Creating query in design view and by using wizard. • Changing between the views. | | | |
| 5 | <ul style="list-style-type: none"> • Insert query parameters to retrieve the data of the table. • Use joins types to show the data. | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Create form using wizard. • Create forms in design view. • Insert input fields & resources. • Insert images. • Place the link (data link) • Format the form & resources. | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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. | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Insert check box. | <ul style="list-style-type: none"> • Using check box control | 2 | 7 | 9 |

| | | | | | |
|------------------|--|---|-----------|-----------|-----------|
| | <ul style="list-style-type: none"> • Insert radio buttons. • Use DO command. • Create splash screen. • Create link between tables and forms. • Display message box. | <ul style="list-style-type: none"> • on the form. • Using radio buttons on the form. • Using do command. • Displaying message box. • Creating log on dialogue box. • Creating splash screen. | | | |
| 9 | <ul style="list-style-type: none"> • Create report by wizard. • Use SQL to create table 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. | <ul style="list-style-type: none"> • Knowledge on the function of the reports. • 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. | 2 | 8 | 10 |
| 10 | <ul style="list-style-type: none"> • Back-up Database | Backup database <ul style="list-style-type: none"> • 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) | | |
|-------|--|---|-----------------|-------|-------|
| | | | THEORY | PRAC. | TOTAL |
| 1. | Familiarize with Structured Query Language (SQL) | <ul style="list-style-type: none"> ➤ 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 | <ul style="list-style-type: none"> ◆ DDL and DML ➤ Introduction | 4 | 2 | 6 |

| | | | | | |
|---|---|--|---|----|----|
| | | <ul style="list-style-type: none"> ➤ Type ➤ Function ➤ Importance ◆ Reserved words and reserved characters ◆ Capital and small characters in SQL | | | |
| 3 | Manage Tables <ul style="list-style-type: none"> ◆ Create table ◆ Drop table ◆ Alter table ◆ Truncate table ◆ Assign Primary key and foreign key | <ul style="list-style-type: none"> ◆ Data and data types ◆ Numerical data types ◆ String data types ◆ Null Values ◆ Concept of tables | 2 | 12 | 14 |
| 4 | Edit Data Records <ul style="list-style-type: none"> ◆ Insert ◆ Update ◆ Delete | <ul style="list-style-type: none"> ◆ Concept of data editing | 2 | 8 | 10 |
| 5 | Obtain reference Data <ul style="list-style-type: none"> ◆ SELECT command ◆ Obtain Conditional reference data using WHERE ◆ Join tables ◆ Query multiple relations ◆ Group by ◆ Order by ◆ Sub query UNION | <ul style="list-style-type: none"> ◆ Concept of referencing data ◆ Syntax, operators and it's types ◆ Conditional clauses | 2 | 14 | 16 |
| 6 | Familiarize with Operators <ul style="list-style-type: none"> ◆ Apply Arithmetic operators ◆ Apply Comparison operators ◆ Apply Logical operators | Operators <ul style="list-style-type: none"> ➤ 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 <ul style="list-style-type: none"> ◆ Create view ◆ Drop view | <ul style="list-style-type: none"> ◆ Introduction of views | 1 | 8 | 9 |
| 8 | Perform Transaction <ul style="list-style-type: none"> ◆ Dead lock problem ◆ Begin transaction | Transaction <ul style="list-style-type: none"> ➤ Introduction ➤ Type | 2 | 15 | 17 |

| | | | | | |
|------------------|--|--|-----------|-----------|------------|
| | <ul style="list-style-type: none"> ◆ Commit transaction ◆ Rollback transaction Save point | <ul style="list-style-type: none"> ➤ Function ➤ Importance | | | |
| 9 | Familiarize with Functions <ul style="list-style-type: none"> ◆ 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.
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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 <ul style="list-style-type: none"> ◆ Write Algorithm ◆ Draw flow chart | <ul style="list-style-type: none"> ◆ 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 <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Variables and data types ◆ Constants | 1 | 4 | 5 |

| | | | | | |
|------------------|--|--|-----------|-----------|------------|
| | | <ul style="list-style-type: none"> ◆ Naming conventions ◆ Keywords | | | |
| 4. | Apply operator in a program | Types of operators <ul style="list-style-type: none"> ◆ Arithmetic operators ◆ assignment increment and decrement operators ◆ Logical operators ◆ Relational operator ◆ Bitwise operator | 3 | 10 | 13 |
| 5. | Apply control statement and loop in a program | Control statement & looping <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Initializing arrays ◆ Loop in Array ◆ One and two dimensional arrays | 4 | 3 | 7 |
| 7. | Declare, define and implement the functions in a program | <ul style="list-style-type: none"> ◆ Introduction to Function ◆ Declaration of Function ◆ Return Type and Argument passing in Array | 3 | 10 | 13 |
| 8. | Define String function | <ul style="list-style-type: none"> ◆ String in C ◆ String Function | 2 | 3 | 5 |
| 9. | Define pointer | <ul style="list-style-type: none"> ◆ Introduction of Pointer ◆ Pointer and Array ◆ Pointer and Function | 2 | 3 | 5 |
| 10. | Define structures | <ul style="list-style-type: none"> ◆ Introduction of Structure ◆ Structure & Pointer | 2 | 3 | 5 |
| 11. | Handle file | <ul style="list-style-type: none"> ◆ Opening and closing files ◆ File modes ◆ Reading and writing a text file | 2 | 7 | 9 |
| 12. | Initialize graphics concept | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Visual Programming Concept ◆ Concept of .NET Framework | 2 | 1 | 3 |
| 2. | Set Up Visual Programming and Playing with Visual Basic IDE | <ul style="list-style-type: none"> ◆ Installation of Visual Basic .net ◆ Types of project in .NET ◆ IDE of VB.NET: Menu bar, Toolbar, Solution Explorer, Toolbox properties, Form Designer, Output Window, Object Browser. ◆ Environment: Editor Tab, Format Tab, General Tab, Docking tab, ◆ Methods and Events | 2 | 2 | 4 |
| 3. | Apply Variables, Constants and Data Types in Visual Programming | <ul style="list-style-type: none"> ◆ Variables and Data Types ◆ Variable Declaration, Scope and Life time ◆ Constants | 2 | 4 | 6 |
| | Apply String and Array in visual programming | <ul style="list-style-type: none"> ◆ Concept of Array ◆ String Handling in VB | 2 | 4 | 6 |
| | Create a Control Structure and its Operators in Visual Programming | <ul style="list-style-type: none"> ◆ 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 ◆ SelectCase Multiple-Selection Structure ◆ Using the Exit Keyword in a Repetition Structure | 2 | 20 | 22 |

| | | | | | |
|----|--|--|---|----|----|
| | | <ul style="list-style-type: none"> ◆ Logical Operators | | | |
| | Apply Function and Sub with return types and arguments | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Control of Form ◆ Windows form: Textbox, Label, Button, ListBox, ComboBox, CheckBox, Picture Box, RadioButton, ScrollBar, Timer, ListView, Toolbar, Statusbar and Properties ◆ Dialog. OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog ◆ Designing Menu: Context Menu, access And shortcut Key | 1 | 15 | 16 |
| 5. | Create a Class and Object using visual basic object, components Create .dll file as components | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Concept of Exception Handling ◆ Try ◆ Catch | 1 | 4 | 5 |
| 7 | Create Database Connection using ADO.net Apply SQLDB and OLEDB Apply DataAdapter, Command and Reader in ADO ,Net | <ul style="list-style-type: none"> ◆ 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 | | | 15 | |

| | | | | | |
|------------------|--|--|-----------|-----------|------------|
| | with form, data connection, control form and reports as Project Work | | | | |
| Sub-Total | | | 20 | 99 | 119 |

References:

- 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.
- E. Balagurusamy, “Programming with ANSI-C”, Fourth Edition, 2008, Tata McGraw Hill.
- B.W. Kernighan & D. M. Ritchie, “The C Programming Language”, Second Edition, 2001, Pearson Education
- Baral, D.S., Baral, D. & Ghimire S. K., *The secretes of C programming language*. Kathmandu, Bhundi Purana Prakasan.
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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 | <ul style="list-style-type: none">♦ Computer History, <i>Generation</i>, Evolution and types♦ Computer function procedure | 1 | | 1 |
| 2. | Familiarize with Classification of Computers | <ul style="list-style-type: none">♦ Technology, Uses and Capacity of computer | 1 | 1 | 2 |

| | | | | | |
|----|---|---|---|----|----|
| 3. | <p>Identify the computer components:</p> <ul style="list-style-type: none"> ◆ 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 ◆ Storage devices (HDD,Optical disk, Flash Disk) ◆ Slots & ports | <ul style="list-style-type: none"> ◆ 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 ◆ Power supply ◆ PCI Devices ◆ Storage devices (HDD,Optical disk, Flash Disk) | 3 | 15 | 18 |
| 4. | <p>Familiarize with Printer</p> <ul style="list-style-type: none"> ◆ Identify Printer components ◆ Install printer driver ◆ Replace tonner/cartridge ◆ Connect printer ◆ Troubleshoot Printer | <ul style="list-style-type: none"> ◆ Basic Operation & Installation of Printer ◆ Types of Printer ◆ Resolution ◆ Port/slot | 1 | 4 | 5 |
| 5. | <p>Familiarize with Scanner</p> <ul style="list-style-type: none"> ◆ Identify Scanner component ◆ Connect scanner ◆ Install scanner device ◆ Operate scanner | <ul style="list-style-type: none"> ◆ Basic Operation of Scanner ◆ Types of Scanner ◆ Resolution ◆ Port/slot | 1 | 2 | 3 |
| 6. | <p>Familiarize with Power Backup System</p> <ul style="list-style-type: none"> ◆ Install UPS | <p>Power backup sysem</p> <ul style="list-style-type: none"> ◆ Importance ◆ Types ◆ Maintenance | 1 | 1 | 2 |
| 7 | <p>Assemble computer</p> <ul style="list-style-type: none"> ◆ Assemble Casing ◆ Mount motherboard ◆ Install RAM ◆ Install Hard Disk ◆ Install cards | <p>Introduction, Types, function & specification of:</p> <ul style="list-style-type: none"> ◆ Casing, motherboard, RAM, hard Disk, processor, optical drive, cards, Slots/ports, display | 2 | 20 | 22 |

| | | | | | |
|-----|---|---|---|----|----|
| | <ul style="list-style-type: none"> ◆ Install processor with heat sink ◆ Install SMPS ◆ Install optical drive ◆ Connect interfaces ◆ Connect Display ◆ Connect keyboard ◆ Connect mouse | and input units | | | |
| 8. | <p>Operate MS-DOS</p> <ul style="list-style-type: none"> ◆ Create/Save/Copy/Move/Delete files ◆ Make/Change/Remove directory ◆ Format disks ◆ Change attributes ◆ Create/use BAT file | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ System requirements ◆ Installation process of Operating Software ◆ Driver Installation ◆ Application Software ◆ File system ◆ Process of partition. | 2 | 10 | 12 |
| 10. | Install Utilities Software | <ul style="list-style-type: none"> ◆ 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) | <ul style="list-style-type: none"> ◆ Component of Multimedia ◆ Application of Multimedia | 1 | 4 | 5 |
| 14. | <p>Familiarize with Computer Security</p> <ul style="list-style-type: none"> ● Setup Firewall ● Install antivirus ● Create/delete password on computer | <ul style="list-style-type: none"> ● 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 | 1 | 2 | 3 |

| | | | | | |
|------------------|--|--|-----------|-----------|------------|
| | | <ul style="list-style-type: none"> • Introduction to Personal & General Security of Personal Computer • Ideas of Password Protection to Personal Computer • Internet Browser Security & Web Security | | | |
| 15. | Troubleshoot computer system faults <ul style="list-style-type: none"> • Run System tools • Repair/replace computer hardware components. | <ul style="list-style-type: none"> ♦ 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 | <ul style="list-style-type: none"> ♦ Computer network <ul style="list-style-type: none"> • Introduction ♦ Types (LAN/ MAN/ WAN) • Function • Importance • <i>Advantage/Disadvantage</i> • <i>Network architecture</i> | 1 | 1 | 2 |
| 2. | Familiarize with Topology and transmission media | <ul style="list-style-type: none"> ♦ 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 | <ul style="list-style-type: none"> • Reference model <ul style="list-style-type: none"> • Introduction • Types • Function | 2 | 2 | 4 |

| | | | | | |
|----|--|---|---|----|----|
| | | <ul style="list-style-type: none"> • Layers of OSI reference model /7 Layers (Application layer, Presentation layer, Session layer, Transport layer, Network layer, Data link layer, Physical layer) | | | |
| 4 | <p>Familiarize with Network Protocols</p> <ul style="list-style-type: none"> • Assign IP address | <ul style="list-style-type: none"> ◆ Introduction and function of <ul style="list-style-type: none"> ➤ IPX/SPX ➤ Apple Talk ➤ Net BIOS and Net BEUI ➤ TCP/IP ◆ Relationship between Ethernet and TCP/IP ◆ IP address <ul style="list-style-type: none"> • Introduction • Types (class A, B, C, D, E) ◆ Subnet mask ◆ 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) | 4 | 2 | 6 |
| 5. | <p>Install & configure</p> <ul style="list-style-type: none"> • NIC • Modem • Repeater • HUB and Switching HUB • Bridge • Router | <ul style="list-style-type: none"> ◆ Introduction and function of <ul style="list-style-type: none"> • NIC • Modem • Repeater • HUB and Switching HUB. Cascade connecting. • Bridge • Router | 2 | 10 | 12 |
| 6. | <p>Perform Network Wiring</p> <ul style="list-style-type: none"> • Mark cable route & components. • Lay cable. | <p>Network wiring</p> <ul style="list-style-type: none"> ◆ Layout diagram ◆ Wiring technique ◆ Marking technique | 1 | 15 | 16 |

| | | | | | |
|-----|---|---|---|----|----|
| | <ul style="list-style-type: none"> • Install PVC conduit pipe/PVC batten. • Install junction Box • Install Jack Socket. | <ul style="list-style-type: none"> ◆ Cable types & size ◆ Size & uses of junction box. ◆ Introduction, size & uses of different jacks/sockets. | | | |
| 7. | <p>Connect Network cables</p> <ul style="list-style-type: none"> • Connect RJ45 Jack • Connect RJ45 Socket. | <ul style="list-style-type: none"> ◆ Cable types & size ◆ Jacks & Connector ◆ Clamper ◆ Connection tester ◆ Multimeter ◆ Soldering process | 1 | 5 | 6 |
| 8. | <p>Configure windows networking services</p> <ul style="list-style-type: none"> • Share file/folder/drive • Share printer/scanner • Share Internet • Search computer on network. • Assign workgroup • Assign computer name. | <ul style="list-style-type: none"> ◆ Sharing Options. ◆ Permission. | 1 | 10 | 11 |
| 9. | <p>Configure server applications services</p> | <ul style="list-style-type: none"> ◆ File server (FTP, file sharing) ◆ Printer server (Printer sharing, etc) ◆ Web server (WWW etc) ◆ Mail server (POP, SMTP, etc) ◆ Telnet server ◆ DHCP server ◆ DNS server and Windows DNS server. ◆ SNMP server ◆ Proxy server | 2 | 2 | 4 |
| 10. | <p>Provide OS networking services</p> | <ul style="list-style-type: none"> ◆ Windows NT, 2000 Server, 2003 Server ◆ Unix ◆ Linux ◆ Others (Net BSD, NetWare, etc) | 1 | 1 | 2 |
| 11. | <p>Configure printing system in networking services</p> <ul style="list-style-type: none"> • Install Printer | <ul style="list-style-type: none"> ◆ Network Printer ◆ Printer server ◆ Permission | 1 | 5 | 6 |

| | Server | | | | |
|------------------|--|--|-----------|-----------|------------|
| 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 |

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- Computer Operator Google, Author by Er. Suvash Chandra Gautama
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- 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 | <ul style="list-style-type: none"> ◆ Data processing system <ul style="list-style-type: none"> ➤ Definition ➤ Function ➤ Importance | 1 | | 1 |
| 2. | Explain Management Information System | <ul style="list-style-type: none"> ◆ Management information system <ul style="list-style-type: none"> ➤ Definition ➤ Function ➤ Importance | ½ | | ½ |
| 3. | Describe Data support system | <ul style="list-style-type: none"> ◆ Decision support systems <ul style="list-style-type: none"> ➤ Definition ➤ Function ➤ Importance | ½ | | ½ |
| 4. | Understand artificial intelligence | <ul style="list-style-type: none"> ◆ Artificial intelligence <ul style="list-style-type: none"> ➤ Definition ➤ Function | ½ | | ½ |

| | | | | | |
|------------------|--|--|----------|----------|----------|
| | | ➤ Importance | | | |
| 5. | Identify system analysis and design | <ul style="list-style-type: none"> ◆ System analysis/design identify ➤ Definition ➤ Function ➤ Importance | ½ | | ½ |
| 6. | Familiarize with system development and flow | <ul style="list-style-type: none"> ◆ System analysis ◆ System design ◆ Program design ◆ Programming ◆ Program test ◆ System test ◆ Running test | 1 | 2 | 3 |
| 7. | Prepare major system development models | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Project initiation, Specific sign of problem | ½ | 1 | 1½ |
| 2. | Identify opportunity for improvement | <ul style="list-style-type: none"> ◆ Possibilities for improvement, criteria for selection of system projects | ½ | 1 | 1½ |
| 3. | Determine feasibility | <ul style="list-style-type: none"> ◆ Objectives, Resources ◆ Types of feasibility; Technical, Economical, Operational ◆ Making judgement on feasibility | 1 | 1 | 2 |
| 4. | Plan / Control activities | <ul style="list-style-type: none"> ◆ Time estimation, Gantt charts, CPM and PERT | 1 | 1 | 2 |
| 5. | Manage analysis / design activities | <ul style="list-style-type: none"> ◆ Communication strategies for team management, ◆ Productivity goal, motivation ◆ Project failures | 1 | 1 | 2 |
| Sub-Total | | | 4 | 5 | 9 |

Module 3: Collect data

| S.N o. | TASKS | RELATED KNOWLEDGE | TIME (IN HOURS) | | TOTAL |
|-----------|----------------------------------|---|-----------------|-------|-------|
| | | | THEORY | PRAC. | |
| 1. | Design sample | <ul style="list-style-type: none"> ♦ Need of sampling ♦ Types of sampling; Convenience, Purposive, Random ♦ Sample size. | 1 | 1 | 2 |
| 2. | Conduct interview | <ul style="list-style-type: none"> ♦ Planning interview, Objectives of interview ♦ Types of question; Close & Open ended, Probe ♦ Question pitfalls | 1 | 1 | 2 |
| 3. | Administer questionnaires | <ul style="list-style-type: none"> ♦ Planning questionnaire administration ♦ Scales in questionnaire ♦ Validity, Reliability ♦ Clustering of questions of similar content | 1 | 1 | 2 |
| 4. | Observe decision making activity | <ul style="list-style-type: none"> ♦ Time event sampling, body language of decision maker | 1 | 1 | 2 |
| 5. | Observe office environment | <ul style="list-style-type: none"> ♦ Filmic & Organisational elements, STROBE (<i>STR</i>uctured <i>O</i>bservation of the <i>E</i>nvironment) | 1 | 1 | 2 |
| 6. | Develop prototype / model | <ul style="list-style-type: none"> ♦ Types of Prototypes; Patched up, Non-operational, First-of-a-series, Selected featured ♦ Guidelines for | 2 | 2 | 4 |

| | | | | | |
|------------------|--|--|----------|----------|-----------|
| | | developing a prototypes ♦ Modifications on user's interface ♦ Advantage and disadvantage of prototypes | | | |
| Sub-Total | | | 7 | 7 | 14 |

Module 4: Analyze /Process data

| S.N o. | 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 | 2 | 2 | 4 |

| | | | | | |
|------------------|---------------------------------|---|----------|-----------|-----------|
| | | <ul style="list-style-type: none"> Multiple criteria for decision making; Trade-off, Weighting, Sequential elimination and Goal programming | | | |
| 5. | Prepare/Present system proposal | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Objectives of effective output Output technology Avoiding biases Functional and stylistic/Aesthetic attributes | 1 | 2 | 3 |
| 2. | Design input | <ul style="list-style-type: none"> Guidelines for form design, Screen design; Icons and Colours | 1 | 1 | 2 |
| 3. | Design file/database | <ul style="list-style-type: none"> Conventional files and databases Data concepts File and database | 1 | 1 | 2 |

| | | | | | |
|------------------|------------------------------|--|----------|-----------|-----------|
| | | organisation ♦ Normalisation | | | |
| 4. | Design user interface | ♦ Types of user interface; Natural language, Question-and-Answer, Menus, input/output, Command language, Direct manipulation and the Mouse | 1 | 2 | 3 |
| 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: 65 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 | <ul style="list-style-type: none"> ◆ Communication <ul style="list-style-type: none"> ➤ Introduction ➤ Types ➤ Functions ➤ Importance ◆ Communicating directives, instructions and policies ◆ Communication medias <ul style="list-style-type: none"> ➤ Telephone, ➤ Face-to-face, ➤ Written or ➤ Visual ➤ Internet ◆ Flow of ideas, suggestions and queries | 2 | 2 | 4 |
| 3 | Perform internal communication | <ul style="list-style-type: none"> ◆ Introduction ◆ Importance ◆ means of communication ◆ process | 1 | 2 | 3 |
| 4 | Perform external communication | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Techniques of oral communication ◆ Non-verbal cues or body language ◆ Logistics and conducive environment required for interview situation | 2 | 4 | 6 |
| 2 | Prepare meeting | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Format and components of a standard agenda of the meeting ◆ Contents of a mailing list | 1 | 1 | 2 |
| 5 | Arrange meeting | <ul style="list-style-type: none"> ◆ Requirements of a meeting ◆ Sitting arrangements ◆ Logistic arrangement | 1 | 2 | 3 |
| 6 | Conduct meeting | <ul style="list-style-type: none"> ◆ Meeting tools, Equipments and material ◆ Opinions/ discussions and real decisions | 1 | 5 | 6 |
| 7 | Write minutes | <ul style="list-style-type: none"> ◆ Introduction ◆ Importance ◆ criteria/components ◆ writing process | 1 | 4 | 5 |
| 8 | Plan for Conference | <ul style="list-style-type: none"> ◆ Nature and activities of a conference | 1 | 2 | 3 |
| 9. | Finalize Arrangements for the Conference | <ul style="list-style-type: none"> ◆ Conference details, and related activities and requirement | 1 | 2 | 3 |
| 10. | Host the Conference | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Letter ◆ Definition ◆ Types ◆ Function ◆ Importance ◆ Letter writing style and its layout | 1 | 2 | 3 |
| 2. | Plan letter | <ul style="list-style-type: none"> ◆ Right order to a letter ◆ Spider diagram and correct language | 1 | 2 | 3 |
| 3. | Compose letter | <ul style="list-style-type: none"> ◆ Format and components ◆ Layout of a letter ◆ Letter structure ◆ Differences in: <ul style="list-style-type: none"> ➤ Blocked, ➤ Semi-blocked and ➤ Full-blocked style ◆ Open and closed punctuation system | 2 | 7 | 9 |
| 5. | Write memoranda | <ul style="list-style-type: none"> ◆ Format and components of memoranda | 1 | 3 | 4 |
| 6. | Preplan / Perform groundwork for report writing | <ul style="list-style-type: none"> ◆ Format and components of a report ◆ Types of report ◆ Regular/routine ◆ Occasional ◆ Especially commissioned ◆ Schematic investigator | 1 | 2 | 3 |

| | | | | | |
|------------------|--------------------------------|---|----------|-----------|-----------|
| 7. | Compose Extended Format Report | <ul style="list-style-type: none"> ◆ 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 | <ul style="list-style-type: none"> ◆ Format and component parts of a formal report | 1 | 2 | 3 |
| 9. | Organize Short Informal Report | <ul style="list-style-type: none"> ◆ 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Definition of entrepreneur • Definition of entrepreneurship • Entrepreneurship development process | 0.5 | 0.5 | 1.0 |
| 3 | Describe entrepreneur's characteristics | Entrepreneur's characteristics: <ul style="list-style-type: none"> • Characteristics of entrepreneurs • Nature of entrepreneurs | 0.67 | 0.83 | 1.5 |
| 4 | Assess entrepreneur's characteristics | Assessment of entrepreneur's characteristics: <ul style="list-style-type: none"> • List of human characteristics • Assessment of entrepreneurial characteristics | 0.5 | 1.0 | 1.5 |
| 5 | Compare entrepreneur with other occupations | Entrepreneur and other occupations: <ul style="list-style-type: none"> • Comparison of entrepreneur with other occupations • Types and styles of entrepreneurs | 1.0 | | 1.0 |
| 6 | Differentiate between entrepreneur and employee | Entrepreneur and employee: <ul style="list-style-type: none"> • Difference between entrepreneur and employee • Benefit of doing own business | 0.5 | 0.5 | 1.0 |
| 7 | Assess "Self" | "Self" assessment: <ul style="list-style-type: none"> • Understanding "self" • Self-disclosure and feedback taking | 0.6 | 0.4 | 1.0 |
| 8 | Entrepreneurial personality test: <ul style="list-style-type: none"> • Assess "Self" inclination to business | Entrepreneurial personality test: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Concept of creativity | 1.67 | 0.33 | 2.0 |

| | | | | | |
|--|--|--|--------------|--------------|--------------|
| | | <ul style="list-style-type: none"> Barriers to creative thinking | | | |
| 10 | Innovate business idea | <p><u>Innovation:</u></p> <ul style="list-style-type: none"> Concept of innovation SCAMPER Method of innovation | 0.83 | 0.67 | 1.5 |
| 11 | Transfer ideas into action | <p><u>Transformation of idea into action:</u></p> <ul style="list-style-type: none"> Concept of transferring idea into action Self-assessment of creative style | 1.0 | 0.5 | 1.5 |
| 12 | Assess personal entrepreneurial competencies | <p><u>Personal entrepreneurial competencies:</u></p> <ul style="list-style-type: none"> Concept of entrepreneurial competencies Assessing personal entrepreneurial competencies | 0.5 | 1.0 | 1.5 |
| 13 | Assess personal risk taking attitude | <p><u>Risk taking attitude:</u></p> <ul style="list-style-type: none"> Concept of risk Personal risk taking attitude Do and don't do while taking risk | 1.5 | 1.0 | 2.5 |
| 14 | Make decision | <p><u>Decision making:</u></p> <ul style="list-style-type: none"> 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 | <p>Identify/ select potential business idea</p> <ul style="list-style-type: none"> Analyze strength, Weakness, Opportunity and Threat (SWOT) of business idea | <p><u>Identification and selection of potential business:</u></p> <ul style="list-style-type: none"> 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 | <p><u>Market and marketing:</u></p> <ul style="list-style-type: none"> Concept of market and marketing | 1.33 | 0.75 | 2.08 |

| | | | | | |
|----|---|--|------|------|------|
| | | <ul style="list-style-type: none"> • Marketing and selling • Market forces • 4 Ps of marketing • Marketing strategies | | | |
| 17 | <p>Business exercise:</p> <p>Explore small business management concept</p> | <p><u>Business exercise:</u></p> <ul style="list-style-type: none"> • Business exercise rules • Concept of small business management • Elements of business management <ul style="list-style-type: none"> • Planning • Organizing • Executing • Controlling | 1.58 | 1.67 | 3.25 |
| 18 | Prepare market plan | <p><u>Business plan/Market plan</u></p> <ul style="list-style-type: none"> • Concept of business plan • Concept of market plan • Steps of market plan | 2.0 | 2.0 | 4.0 |
| 19 | Prepare production plan | <p><u>Business plan/Production plan:</u></p> <ul style="list-style-type: none"> • Concept of production plan • Steps of production plan | 1.25 | 1.5 | 2.75 |
| 20 | Prepare business operation plan | <p><u>Business plan/Business operation plan:</u></p> <ul style="list-style-type: none"> • Concept of business operation plan • Steps of business operation plan • Cost price determination | 2.5 | 2.67 | 5.17 |
| 21 | Prepare financial plan | <p><u>Business pan/Financial plan:</u></p> <ul style="list-style-type: none"> • 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 | <p><u>Information collection and preparing business plan:</u></p> <ul style="list-style-type: none"> • Introduction • Market survey | 2.0 | 13.0 | 15.0 |

| | | | | | |
|---------------|-----------------------------|---|-----------|-----------|-----------|
| | | <ul style="list-style-type: none"> • 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 | | | |
| 23 | Appraise business plan | <p><u>Business plan appraisal:</u></p> <ul style="list-style-type: none"> • Return on investment • Breakeven analysis • Cash flow • Risk factors | 0.5 | 5.5 | 6.0 |
| 24 | Maintain basic book keeping | <p><u>Basic book keeping:</u></p> <ul style="list-style-type: none"> • 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) | | |
|-------|---|--|-----------------|-----------|-------|
| | | | THEOR Y | PRAC . | TOTAL |
| 1 | Identify Hazard and Risk | <ul style="list-style-type: none"> ▪ Introduction of Occupational Health & Safety. ▪ Types of hazard. ▪ Electrical Hazard ▪ Hazard Control Principle. | 2 | 1 | 3 |
| 2. | Use Personal Protective Equipment (PPEs) | <ul style="list-style-type: none"> ▪ PPEs according to work. ▪ Safety precautions and safety rules. | 2 | 1 | 3 |
| 3. | Familiarize with Charge/Voltage /Current/ Resistance / resistivity/conductivity | <ul style="list-style-type: none"> ▪ Introduction to charge, Voltage and Current ▪ Symbol and units ▪ Sources of electricity and potential difference ▪ Flow of current ▪ Resistivity of a material ▪ Effect of temperature on resistance ▪ Resistors in series, parallel and mixed(series+parallel) ▪ Resistors colour code | 3 | 2 | 5 |

| | | | | | |
|----|--|---|-----|----|-----|
| | | <ul style="list-style-type: none"> ▪ Voltage dividers | | | |
| 4. | Familiarise with electrical signals | <ul style="list-style-type: none"> ▪ AC and DC signals ▪ Frequency and waveform ▪ AC and DC sources | 0.5 | 1 | 1.5 |
| 5. | Perform electrical measurements <ul style="list-style-type: none"> • Measure voltage • Measure current • Measure resistance | <ul style="list-style-type: none"> ▪ 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 <ul style="list-style-type: none"> • Connect resistor • Connect DC supply • Verify formula | <ul style="list-style-type: none"> ▪ Statement ▪ formula | 0.5 | 2 | 2.5 |
| 7. | Apply Kirchoff's Law <ul style="list-style-type: none"> • Connect KCL circuit • Connect KVL circuit • Verify formula | <ul style="list-style-type: none"> ▪ 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 | <ul style="list-style-type: none"> ▪ Definition of power and energy ▪ Relation of power with voltage and current. | 0.5 | 2 | 2.5 |
| 9. | Perform electrical wiring <ul style="list-style-type: none"> • 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 | <p><u>Electrical wiring</u></p> <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Connect capacitor in series • Connect capacitor in parallel | <ul style="list-style-type: none"> ▪ 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 | <ul style="list-style-type: none"> ▪ Principle of inductor ▪ Self, mutual inductance and permeability | 0.5 | 1 | 1.5 |
| 12. | Use Transformers in rectifier circuit | <ul style="list-style-type: none"> ▪ Basic principle and types of transformers | 0.5 | 1 | 1.5 |
| 13. | Apply the principle of semiconductor and diodes <ul style="list-style-type: none"> • Connect diode in forward bias. • Connect diode in reverse bias. | <ul style="list-style-type: none"> ▪ 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. | <ul style="list-style-type: none"> ▪ Principle, types & application of I.C. | 1 | 1 | 2 |
| 16. | Convert various number system | <ul style="list-style-type: none"> ▪ Types of number system (binary, decimal, Octal & Hexadecimal) | 2 | 2 | 4 |
| 17. | Apply the principle of Logical function on Gates | Principle and types of <ul style="list-style-type: none"> ▪ 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

Total: 78 hours

Theory: hours

Practical: 78 hours

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.