

Course Title: Computer Fundamentals and Applications (4 Cr.)

Course Code: CACS101

Year/Semester: I/I

Class Load: 8 Hrs. / Week (Theory: 4 Hrs., Practical: 4 Hrs.)

Course Description

This course offers fundamental concepts of computer and computing which includes introduction to computer system, computer software & database management system, operating system, data communication & computer network and contemporary technologies. It also aims at helping students convert theoretical concept into practical skill through the use of different application packages including word processor, spreadsheet package, presentation package and photo editing graphical package.

Course Objectives

The general objectives of this course are to provide fundamental concepts of information and communication technology and to make students capable of using different application packages in their personal as well as professional life.

Course Contents

Unit 1 Introduction to Computer System

16 Hrs.

Introduction to Computer, Characteristics of Computer, Applications of Computer, Classification of Computer, Mobile Computing, Anatomy of a Digital Computer, Computer Architecture, Memory & Its Classification, Input devices, Output Devices, Interfaces.

Unit 2 Computer Software

3 Hrs.

Introduction to Software, Types of Software, Program vs. Software, Computer Virus and Antivirus.

Unit 3 Operating System

4 Hrs.

Introduction to Operating System, Function of Operating System, Types of Operating System, Open Source Operating System.

Unit 4 Database Management System

8 Hrs.

Introduction to DBMS, Database Models, SQL, Database Design and Data Security, Data Warehouse, Data Mining, Database Administrator

Unit 5 Data Communication and Computer Network

10 Hrs.

Introduction to communication system, Mode of Communication, Introduction to Computer Network, Types of Computer Network, LAN Topologies, Transmission Media, Network Devices, OSI Reference Model, Communication Protocols, Centralized vs. Distributed System.

Unit 6 Internet and WWW **6 Hrs.**

Internet: Introduction to Internet and its Applications, Connecting to the Internet, Client/Server Technology, Internet as a Client/Server Technology, Email, Video-Conferencing, Internet Service Providers, Domain Name Server, Internet Address, Internet Protocols (IP, TCP, HTTP, FTP, SMTP, POP, Telnet, Gopher, WAIS), Introduction to Intranet, Internet vs. Intranet vs. Extranet, Advantages & Disadvantages of Intranet

World Wide Web (WWW): World Wide Web and Its Evolution, Architecture of Web, Uniform Resource Locator (URL), Browsers: Internet Explorer, Netscape Navigator, Opera, Firefox, Chrome, Mozilla; Search Engine, Web Servers: Apache, IIS, Proxy Server; HTTP Protocol, FTP protocol.

Unit 7 Contemporary Technologies **13 Hrs.**

Multimedia, e-Commerce, e-Learning, e-Governance, e-Banking, Hypermedia, Geographical Information System, Virtual Reality, Augmented Reality, Artificial Intelligence, Ambient Intelligence, Robotics, Bit Coin.

Laboratory Works

Laboratory works should cover all the units and topics mentioned below and a project work should be carried out by students individually implementing the concept and skill learnt in this course.

Unit 1 Operating System **10 Hrs.**

a. **GUI Based OS (5 Hrs.):** Interface, GUI vs. CUI, Introduction to Windows, Features, Elements of Windows, Task Bar, Using Menus and Submenus, Opening a Program, Opening Multiple Program, Using Short Cuts, Using My Computer, Switching off the System, Desktop and Custom Wall Papers, Screen Saver, Using Help for Interactive Learning, Using General Accessories: Notepad, Paint Tool, Clip Board, Character Map, Calculator etc.; Using Multimedia: Using CD/DVD/BD, Using Audio/Video; Using Explorer to Manage Files and Folders: Copy/Delete/Rename/Short Cuts; Recycle Bin and Its Uses. Using Format, Scandisk and Disk Defragmenter, Windows Installation and Setting.

b. **CUI Based OS (5 Hrs.):** Introduction to DOS, DOS Internal Commands, DOS External Commands.

Unit 2 Word Processor **12 Hrs.**

Introduction to Word Processor, Features of Word Processor, Elements of Word Window, Creating & Saving Document, Copy Paste and Cut Paste, Format Painter, Undo and Redo, Print Preview, Printing Documents, Fonts, Effect and Character Formatting, Paragraph Formatting, Styles, Finding, Replacing and Selection, Cover Page, Blank Page, Page Break, Working with Table, Inserting Picture, Clip Art, Shapes, Smart Art and Chart, Hyperlink, Bookmarks, Cross-

Referencing, Header, Footer, Page Number, Working with Text Box, Quick Parts, Word Art, Drop Cap, Signature Line, Date & Time, Object, Equation, Symbol, Working with Themes, Page Margins, Page Orientation, Page Size, Columns Handling, Hyphenation, Watermark, Page Color, Page Borders, Indentation, Arranging Objects, Table of Contents, Footnote and Endnote, Citation and Bibliography, Captions, Inserting Index, Table of Authorities, Mail Merge, Spelling and Grammar, Thesaurus, Translation, Word Count, Comments, Tracking, Changes, Compare, Protecting Document, Document Views, Ruler, Gridlines, Document Map, Thumbnails, Zooming, Window Handling, Creating and Using Macro.

Unit 3 Spreadsheet Package

12 Hrs.

Introduction to Spreadsheet Package, Features of Spreadsheet Package, Introduction to Microsoft Excel, Elements of Excel Window, Cell Referencing in Excel: Relative, Absolute, and Mixed; Managing Workbooks, Worksheets, Windows, Working with Worksheet, Printing Worksheet, Using Formulas/functions; Formatting/Conditional Formatting Data & worksheet; Using Paste Special, Essential Worksheet Functions, Using Templates, Protecting the File and Worksheet with Passwords; Working with Graphic Objects: Clip Art, Word Art, Map; Working with Charts, Working with Internal Database, Getting More Power from Worksheet Databases, Accessing External Databases, Loan Amortization Scheduling and Calculation; Data Validation, Consolidating and Outlining, Using What- if Analysis: Data Table, Goal Seek, Scenario Manager; Understanding Pivot Tables, Constructing and Analyzing Pivot Tables, Using Custom Controls on Worksheets, Effectively Using the Macro Recorder

Unit 4 Presentation Package

6 Hrs.

Introduction, Creating and Saving Presentation; Entering, Editing, and Enhancing Text; Editing in different views- Outline View, Slide Sorter View; Creating Graphs, Editing and Enhancing Graphs; Adding ClipArt in Slide, Editing Arts, Animating Charts and Art Objects, Adding Sound, Choosing Sound Effects- Transitional, From Other Sources; Adding Sounds to Animations and Sound Objects; Recording Sound and Narration; Adding Movie in Slides, Playing and Editing Movie; Making Movie Poster and Icon; Slide Show, Setting Slide Transition, Speed and Slide Advancement; Rehearsing Slide Display Timing, Slide Notes and Comments; Editing Text Color, Creating Custom Color; Background and Schemes; Linking and Embedding Objects; Importing and Exporting Presentation; Printing Slides and Handouts

Unit 5 Photo Editing Package

20 Hrs.

Fundamentals

Graphics Basics: Bitmap Vs. Vector-Based Graphics, Color/Bit Depth and Image Resolution, Graphic File Formats, Optimizing Web Graphics, Regular Text Vs.

Anti- Aliased Text, Pixel Resize Vs. Smart Resize, Regular Graphics Vs. Interlaced Graphics, Lossy Compression Vs. Lossless Compression, Dithered Graphics Vs. Non-Dithered Graphics, Standard Selection Vs. Floating Selection, Tolerance, Opacity.

Introduction to Color: Color Modes- RGB, CMYK, Grayscale, LAB, Bitmap; Hue, Saturation, and Brightness; Browser Safe Colors; Shadows, Highlights and Midtones of an Image.

Interface, Tools and Options

Environment: About Photoshop, The Photoshop Interface, Setting up a new Photoshop document, Saving a new document, The Default Palettes, Working with Photoshop Palettes, The Photoshop Toolbox and Options bar, Using Guides and Ruler,

Image and Color Basics: Supported import and export image formats, Opening an Image in Photoshop, Creating Images In Photoshop, Saving Images In Photoshop, Basic Image Editing, Changing Image Size, Cropping an Image, Changing Color/Bit Depth, Optimizing Images using Save for Web, Working with Color in Photoshop

Tools: Parts of the Toolbox, Toolbox Shortcuts, Tools Options, Marquees, Magic wand, Lassos, Move tool, Crop tool, Slice tools, Pencil, Paintbrush, Eraser tools, History brushes, Clone stamp-Pattern stamp, Healing brush tool, Retouch tool, Gradient, Paint bucket, Burn-Dodge-Sponge, Blur-Sharpen-Smudge, Shapes-line- rectangle-polygon-custom shapes, Path selection tool, Pen tool, Type tools, Notes tool-Audio annotation, Eyedropper-Color sampler-Measure tool, Hand-Zoom, Quick mask-Screen modes, Jump to Image Ready, Back ground and Foreground.

Transforms: Using Free transform, Move, Rotate, Scale, Skew, Distort, Perspective, Flip-vertical, horizontal, Invert, Rotate 180°, Rotate 90° CW, Rotate 90° CCW.,

Layers, Channels and Actions

Photoshop Layers: About Layers-Fill and Adjustment Layers, The Layer Palette, Naming Layers, Creating Layers, Deleting Layers, Viewing Layers, Moving Layers, Layer Opacity, Locking Layers, Merging Layers, Layer Modes and Blending Options, Image Compositing Using Layers.

Photoshop Channels: About Channels, The Channel Palette, Creating and Viewing Channels, Modifying Channels, Deleting Channels, Alpha Channels and Masks.

Actions: Using the Action Palette, Recording Action, Playing Action, Editing Action, Loading a Saved Action.

Restoring and Enhancing Images

Restoration of Photos: Restoring Damaged Photos, Photo Retouching.

Photo Enhancement and Color Correction: Changing Levels, Changing Curves, Color Balance, Changing Brightness and Contrast, Changing Hue Saturation and Brightness, Changing a Grayscale Image to a Colored Image, Histogram, Gradient Map, Desaturate, Invert, Color Replace, Selective Color, Equalize, Threshold, Channel Mixer, Posterize, Changing Background using Layer Compositing

Text Editing and Special Effects

Text Editing in PhotoShop: About the Type Layer, Creating Vertical and Horizontal Types, Point and Paragraph Text Creation, Using Horizontal and Vertical Type Mask Tools, Using Character Palette for Text Editing, Choosing a Font, Changing the Type Color, Choosing a Type Size, Specifying Kerning and Tracking, Using Fractional Character Widths, Specifying Baseline Shift, Applying Underline and Strikethrough, Text Alignment and Justification, Specifying Anti-Aliasing, Creating Text Warp, Rasterizing Type, Converting Type to Shapes, Adding Effects to Text

Photoshop Special Effects and Filters: About Special Effects, Using Filters, Basic Filter Examples, Artistic Filters, Distorting Filters, Filter Combinations, Plug-in Filters.

Web Application and Animation

Adobe ImageReady: About Image Ready, Opening Image Ready, The Image Ready Interface, Image Maps, Image Slicing, Basic Animation.

Photoshop for Building Web Interface: About the Interface

Teaching Methods

The teaching faculties are expected to create environment where students can update and upgrade themselves with the current scenario of computing and information technology with the help of topics listed in the syllabus. The general teaching pedagogy that can be followed by teaching faculties for this course includes class lectures, group discussions, case studies, guest lectures, research work, project work, assignments (theoretical and practical), and written and verbal examinations.

Evaluation

Examination Scheme				
Internal Assessment		External Assessment		Total
Theory	Practical	Theory	Practical	
20	20 (3 Hrs.)	60 (3 Hrs.)	-	100

Text Books

- 1 Alexis Leon, Mathews Leon, "Fundamentals of Information Technology, 2/e", Vikas Publishing House Pvt Limited, 2009, ISBN: 9788182092457
- 2 E Balagurusamy, "Fundamentals of Computers," Tata McGraw Hill Education PVT.Ltd., 2009, ISBN: 9780070141605
- 3 Peter Norton's, "Introduction to Computers", 7th Edition, Tata McGraw-Hill, 2010, ISBN: 9780070671201

Reference Books

- 1 Brad Dayley & DaNae Dayley, "Adobe Photoshop CS6 Bible", Wiley Publishing Inc., 2012, ISBN: 978-1-118-12388-1
- 2 Faith Wempen, "Microsoft Office Power Point 2007 Bible (With CD)", Wiley Publishing Inc., 2007, ISBN: 978-0470043684
- 3 Herb Tyson, "Microsoft Office Word 2007 Bible (With CD)", Wiley Publishing Inc., 2007
- 4 Jim Boyce, "Windows 7 Bible ", Wiley Publishing Inc., 2009, ISBN: 978-0470509098
- 5 John Walkenbach, "Microsoft Office Excel 2007 Bible (With CD)", Wiley Publishing Inc., 2007, ISBN: 978-0470044032
- 6 Pradeep Sinha and Priti Sinha, "Computer Fundamentals (with CD)", 6th Edition, BPB Publications, 2003, ISBN: 9788176567527
- 7 Ramesh Rimal & et. al., "Computer Science-I, Revised Edition", Buddha Academic Publishers and Distributors Pvt. Ltd. Nepal, 2013
- 8 Ramesh Rimal & et. al., "Computer Science-II, Revised Edition", Buddha Academic Publishers and Distributors Pvt. Ltd. Nepal, 2013