

Tribhuvan University (TU) BCA First Semester Syllabus

Course Title: Computer Fundamentals and Applications

- **Course Code:** CACS101
 - **Year/Semester:** I/I
 - **Credit Hours:** 4 Cr.
 - **Class Load:** 8 Hrs./Week (Theory: 4 Hrs., Practical: 4 Hrs.)
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Course Description

This course provides fundamental knowledge of computers and computing, including:

- Introduction to computer systems
- Computer software and database management systems
- Operating systems
- Data communication and computer networks
- Contemporary computing technologies

Additionally, the course helps students develop practical skills in using application packages such as **word processors, spreadsheets, presentation software, and photo editing tools.**

Course Objectives

The objectives of this course are:

- To provide fundamental concepts of **information and communication technology (ICT)**
 - To enable students to use **different application packages** in their personal and professional lives
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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
- Functions of Operating System
- Types of Operating System
- Open-Source Operating System

Unit 4: Database Management System (4 Hrs.)

- Introduction to DBMS
- Database Models
- SQL Basics
- Database Design and Data Security
- Data Warehousing and Data Mining
- Role of a Database Administrator

Unit 5: Data Communication and Computer Network (10 Hrs.)

- Introduction to Communication Systems
- Modes of Communication
- Introduction to Computer Networks
- Types of Computer Networks
- LAN Topologies

- Transmission Media
- Network Devices
- OSI Reference Model
- Communication Protocols
- Centralized vs. Distributed Systems

Unit 6: Internet and World Wide Web (WWW) (6 Hrs.)

Internet

- Introduction and Applications
- Connecting to the Internet
- Client/Server Technology
- Email, Video Conferencing
- Internet Service Providers (ISP)
- Domain Name System (DNS)
- Internet Addressing & Protocols (IP, TCP, HTTP, FTP, SMTP, POP, Telnet, Gopher, WAIS)
- Introduction to Intranet, Extranet, and their Advantages

World Wide Web (WWW)

- Evolution and Architecture of the Web
- Uniform Resource Locator (URL)
- Web Browsers: Chrome, Firefox, Internet Explorer, Opera
- Search Engines
- Web Servers: Apache, Proxy Server
- HTTP and FTP Protocols

Unit 7: Contemporary Technologies (13 Hrs.)

- Multimedia
- e-Commerce, e-Learning, e-Governance, e-Banking
- Hypermedia
- Geographical Information System (GIS)
- Virtual Reality & Augmented Reality
- Artificial Intelligence and Robotics

- Ambient Intelligence
 - Cryptocurrency (Bitcoin)
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Laboratory Works

Practical sessions cover all theoretical topics, including a **project work** where students apply concepts and skills learned in this course.

Unit 1: Operating System (10 Hrs.)

GUI-Based OS (5 Hrs.)

- Windows Interface and Features
- Taskbar and Menu Navigation
- Using File Explorer for File Management
- Windows Accessories: Notepad, Paint, Calculator, etc.
- Windows Installation and Settings

CUI-Based OS (5 Hrs.)

- Introduction to DOS
- DOS Internal and External Commands

Unit 2: Word Processor (12 Hrs.)

- Creating, Formatting, and Editing Documents
- Working with Tables, Pictures, Clip Art, Hyperlinks
- Header, Footer, Page Numbering
- Page Layout, Columns, and Margins
- Mail Merge
- Spelling and Grammar Checking
- Macros and Advanced Document Editing

Unit 3: Spreadsheet Package (12 Hrs.)

- Creating and Managing Workbooks
- Cell Referencing (Relative, Absolute, Mixed)
- Data Formatting and Conditional Formatting
- Formulas and Essential Functions

- Pivot Tables and Charts
- Data Validation and Consolidation
- What-If Analysis (Data Table, Goal Seek, Scenario Manager)
- Macros in Spreadsheets

Unit 4: Presentation Package (6 Hrs.)

- Creating and Managing Presentations
- Slide Layout and Formatting
- Graphs and Charts
- Adding Multimedia (Images, Sounds, Videos)
- Slide Transitions and Animations
- Slide Show Timings and Printing Handouts

Unit 5: Photo Editing Package (20 Hrs.)

Fundamentals

- Bitmap vs. Vector Graphics
- Color Depth and Image Resolution
- Graphic File Formats

Photoshop Basics

- Interface, Tools, and Options
- Image Editing, Cropping, and Resizing
- Color Adjustments and Effects
- Working with Layers and Masks

Text Editing and Special Effects

- Text Formatting and Typography
- Applying Filters and Effects
- Creating Animations and GIFs

Teaching Methods

The teaching approach includes:

- **Lectures**

- **Group Discussions**
 - **Case Studies**
 - **Guest Lectures**
 - **Project Work and Assignments**
 - **Practical Sessions**
 - **Written and Verbal Examinations**
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Evaluation

The evaluation system includes:

- **Theory Exam (60%)**
 - **Practical Exam (20%)**
 - **Assignments and Project Work (20%)**
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Textbooks

1. Alexis Leon, Mathews Leon – *Fundamentals of Information Technology*, 2nd Edition, Vikas Publishing, 2009.
2. E. Balagurusamy – *Fundamentals of Computers*, Tata McGraw Hill, 2009.
3. Peter Norton – *Introduction to Computers*, 7th Edition, Tata McGraw-Hill, 2010.

Reference Books

1. Brad Dayley & DaNae Dayley – *Adobe Photoshop CS6 Bible*, Wiley Publishing, 2012.
 2. Faith Wempen – *Microsoft Office PowerPoint 2007 Bible*, Wiley Publishing, 2007.
 3. Herb Tyson – *Microsoft Office Word 2007 Bible*, Wiley Publishing, 2007.
 4. Jim Boyce – *Windows 7 Bible*, Wiley Publishing, 2009.
 5. John Walkenbach – *Microsoft Office Excel 2007 Bible*, Wiley Publishing, 2007.
 6. Pradeep Sinha & Priti Sinha – *Computer Fundamentals*, 6th Edition, BPB Publications, 2003.
 7. Ramesh Rimal et al. – *Computer Science-4 (Revised Edition)*, Buddha Academic Publishers, Nepal, 2013.
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This syllabus provides a **comprehensive foundation in computing and practical applications** for BCA first-year students. It ensures they gain both **theoretical knowledge and hands-on experience** with essential computer tools and technologies. 🚀

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