

**SYLLABUS FOR  
B.VOC. IN COMPUTER APPLICATION  
(CAP)**

**Programme Template:  
B. Voc Course (CBCS) in CAP  
Gauhati University**

<b>Semester</b>	<b>Core course (12 papers, 72 credits)</b>	<b>Ability Enhancement Compulsory Course (AECC) (2 papers, 8 credits)</b>	<b>Skill Enhancement Course (SEC) (4 papers, 16 credits)</b>	<b>Discipline Specific Elective (DSE) (6 papers, 36 credits)</b>
<b>I</b>	<b>CAP-VC-1016</b>	<b>ENG-AE-1014</b>		
	<b>CAP -VC-1026</b>			
	<b>CAP-VC-1036</b>			
<b>II</b>	<b>CAP -VC-2016</b>	<b>ENV-AE-2014</b>		
	<b>CAP -VC-2026</b>			
	<b>CAP-VC-2036</b>			
<b>III</b>	<b>CAP -VC-3016</b>		<b>CAP-SE-3014</b>	
	<b>CAP-VC-3026</b>			
	<b>CAP-VC-3036</b>			
<b>IV</b>	<b>CAP-VC-4016</b>		<b>CAP-SE-4014</b>	
	<b>CAP-VC-4026</b>			
	<b>CAP-VC-4036</b>			
<b>V</b>			<b>CAP-SE-5014</b>	<b>CAP-VE-5016</b>
				<b>CAP-VE-5026</b>
				<b>CAP-VE-5036</b>
<b>VI</b>			<b>CAP-SE-6014</b>	<b>CAP-VE-6016</b>
				<b>CAP-VE-6026</b>
				<b>CAP -VE-6036</b>

**Course Structure for CBCS in B.Voc. in Computer Application as per requirement  
of UGC and Gauhati University**

<b>Semester</b>	<b>Course Type</b>	<b>Paper Code</b>	<b>Paper Name</b>	<b>Paper Type</b>	<b>Credit</b>
I	Core Course	CAP-VC-1016	Fundamentals Of Computer	Theory + Practical	4+2
		CAP-VC-1026	Operating Computer Using GUI Based Operating System	Theory + Practical	4+2
		CAP-VC-1036	Understanding Word Processing	Theory + Practical	4+2
	Ability Enhancement Compulsory Course	ENG-AE-1014	Communicative English	Theory	4
II	Core Course	CAP-VC-2016	Using Spread Sheet	Theory + Practical	4+2
		CAP-VC-2026	Introduction to Internet, Www And Web Browsers	Theory + Practical	4+2
		CAP-VC-2036	Communications And Collaboration	Theory + Practical	4+2
	Ability Enhancement Compulsory Course	ENV-AE-2014	Environmental Science	Theory	4
III	Core Course	CAP-VC-3016	Using Presentations	Theory + Practical	4+2
		CAP-VC-3026	Making Small Presentations	Theory + Practical	4+2
		CAP-VC-3036	Tally	Theory + Practical	4+2
	Skill Enhancement Course	CAP-SE-3014	Basics Of Adobe Pagemaker	Theory + Practical	2+2
IV	Core Course	CAP-VC-4016	DTP With Corel DRAW	Theory + Practical	4+2
		CAP-VC-4026	Web Designing And Programming	Theory + Practical	4+2
		CAP-VC-4036	Introduction To Programming	Theory + Practical	4+2
	Skill Enhancement Course	CAP-SE-4014	Computer Hardware		4

V	Skill Enhancement Course	CAP-SE-5014	Computer Organization And Architecture		4
	Discipline Specific Elective	CAP-VE-5016	Basic Networking Concepts	Theory + Practical	4+2
		CAP-VE-5026	Java Programming	Theory + Practical	4+2
		CAP-VE-5036	Concept Of Computing, Data And Information	Theory + Practical	4+2
VI	Skill Enhancement Course	CAP-SE-6014	Database Management System.		4
	Discipline Specific Elective	CAP-VE-6016	Object Oriented Programming In C++	Theory + Practical	4+2
		CAP-VE-6026	Operating System	Theory + Practical	4+2
		CAP-VE-6036	Internship		6

Total Credits in B.Voc. Computer Application: 132 Credits

**List of Papers**  
**B.Voc. in Computer Application under CBCS**

**Core Papers**

1. CAP-VC-1016            Fundamentals of Computer
2. CAP-VC-1026            Operating Computer Using Gui Based Operating System
3. CAP-VC-1036            Understanding Word Processing
4. CAP-VC-2016            Using Spread Sheet
5. CAP-VC-2026            Introduction To Internet, Www And Web Browsers
6. CAP-VC-2036            Communications And Collaboration
7. CAP-VC-3016            Using Presentations
8. CAP-VC-3026            Making Small Presentations
9. CAP-VC-3036            Tally
10. CAP-VC-4016            DTP with Corel Draw
  
11. CAP-VC-4026                            Web designing and Programming
12. CAP-VC-4036            Introduction To Programming

**Skill Enhancement Papers**

1. CAP-SE-3014 Basics of Adobe PageMaker
2. CAP-SE-4014 Computer Hardware
3. CAP-SE-5014 Computer Organization and Architecture
4. CAP-SE-6014 Database Management System

**Discipline Specific Papers**

1. CAP-VE-5016            Basic networking concepts
2. CAP-VE-5026            Java Programming
3. CAP-VE-5036            Concept of computing, data and information
4. CAP-VE-6016            Object Oriented Programming in C++
5. CAP-VE-6026            Operating System
6. CAP-VE-6036            Internship

**Ability Enhancement Compulsory Course**

- ENG-AE-1014                    Communicative English
- ENV-AE-2014                    Environmental Science

## **Core Courses**

### **Semester I**

#### **Paper: CAP-VC-1016- Fundamental s of COMPUTER**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

#### **THEORY**

**Total marks: 60**

##### **Fundamental s of COMPUTER**

##### **Unit 1: Computer**

Basic Applications of Computer; History of Computers

##### **Unit 2: Components of Computer System**

Central Processing Unit, Keyboard, mouse and VDU, Other Input devices, Other Output devices, Computer Memory

##### **Unit 3: Concept of Hardware and Software**

Hardware, Software, Application Software, Systems software

#### **PRACTICAL**

**Total marks: 20**

#### **Internal Assessment**

**Total marks: 20**

Paper: CAP-VC-1026- **OPERATING COMPUTER USING GUI BASED OPERATING SYSTEM**  
Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

## **THEORY**

**Total marks: 60**

### **Unit 1: Basics of Operating System**

Operating system, Basics of popular operating system (LINUX, WINDOWS)

### **Unit 2: The Interface**

Task Bar, Icons,  
Menu, Running an  
Application

### **Unit 3: Operating System Simple Setting**

Changing System Date and Time, Changing Display Properties, To Add Or Remove A Windows Component, Changing Mouse Properties, Adding and removing Printers

### **Unit 4: File and Directory Management**

Creating and renaming of files and directories, Common utilities

## **PRACTICAL**

**Total marks: 20**

### **Internal Assessment**

**Total marks: 20**

Paper: CAP-VC-1036- **UNDERSTANDING WORD PROCESSING**  
Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total Marks: 100

**THEORY**

**Total marks: 60**

**UNDERSTANDING WORD PROCESSING**

**Unit 1: Word Processing Basics**

Opening Word Processing Package, Menu Bar, Using the Help, Using The Icons Below Menu Bar

**Unit 2: Opening and closing Documents**

Opening Documents, Save and Save as, Page Setup, Print Preview, Printing of Documents

**Unit 3: Text Creation and manipulation**

Document Creation, Editing Text, Text Selection, Cut, Copy and Paste, Spell check, Thesaurus

**Unit 4: Formatting the Text**

Font and Size selection, Alignment of Text, Paragraph Indenting, Bullets and Numbering, Changing case

**Unit 5: Table Manipulation**

Draw Table, Changing cell width and height, Alignment of Text in cell, Delete / Insertion of row and column, Border and shading

**PRACTICAL**

**Total marks: 20**

**Internal Assessment**

**Total marks: 20**



## **Semester II**

Paper: CAP-VC-2016- USING SPREAD SHEET

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

### **THEORY**

**Total marks: 60**

#### **Unit 1: Elements of Electronic Spread Sheet**

Opening of Spread Sheet, Addressing of Cells, Printing of Spread Sheet, Saving Workbooks

#### **Unit 2: Manipulation of Cells**

Entering Text, Numbers and Dates, Creating Text, Number and Date Series, Editing Worksheet Data, Inserting and Deleting Rows, Column, Changing Cell Height and Width

#### **Unit 3: Formulas and Function**

Using Formulas, Function

#### **Unit 4: Creating Simple charts**

Column, Line, Pie, Bar, Area, Scatter, Stock, Surface, Doughnut, Bubble, Radar

### **PRACTICAL**

**Total marks: 20**

#### **Internal Assessment**

**Total marks: 20**

**Paper: CAP-VC-2026-**

Total Lectures: 40 Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

**THEORY**

**Total marks: 60**

**INTRODUCTION TO INTERNET, WWW AND WEB BROWSERS**

**Unit 1: Basic of Computer Networks**

Local Area Network (LAN), Wide Area Network (WAN)

**Unit 2: Internet**

Concept of Internet, Applications of Internet, Connecting to the Internet, Troubleshooting

**Unit 3: World Wide Web (WWW)**

Web Browsing Softwares, Popular Web Browsing Softwares

**Unit 4: Search Engines**

Popular Search Engines / Search for content, Accessing Web Browser, Using Favorites Folder, Downloading Web Pages, Printing Web Pages

**Unit 5: Understanding URL**

Surfing the web, Using e-governance website

**PRACTICAL**

**Total marks: 20**

**Internal Assessment**

**Total marks: 20**

**Paper: CAP-VC-2036- COMMUNICATIONS AND COLLABORATION**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

**THEORY**

**Total marks: 60**

**Unit 1: Basics of E-mail**

Electronic Mail, Email Addressing

**Unit 2: Using E-mails**

Opening Email account, Mailbox: Inbox and Outbox, Creating and Sending a new E-mail, Replying to an E-mail message, Forwarding an E-mail message, Sorting and Searching emails

**Unit 3: Document collaboration**

**Unit 4: Instant Messaging and Collaboration**

Using Instant messaging, Instant messaging providers, Netiquettes

**PRACTICAL**

**Total marks: 20**

**Internal Assessment**

**Total marks: 20**

## **Semester III**

### **CAP-VC-3016- Using Presentation**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

#### **THEORY**

**Total marks: 60**

##### **Unit 1: Basics of Presentation**

Creating slides with other layouts, Using PowerPoint, Opening a PowerPoint Presentation, Saving A Presentation

##### **Unit 2: Creation of Presentation**

Creating a Presentation Using a Template, Creating a Blank Presentation, Entering and Editing Text, Inserting and Deleting Slides in a Presentation

**Unit 3:** Apply transitions in a presentation.

**Unit 4:** Apply animations in a presentation.

#### **PRACTICAL**

**Total marks: 20**

#### **Internal Assessment**

**Total marks: 20**

Paper: CAP-VC-3026- **MAKING SMALL PRESENTATIONS**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

**THEORY**

**Total marks: 60**

**Unit 1: Preparation of Slides**

Inserting Word Table or an Excel Worksheet, Adding Clip Art Pictures, Inserting Other Objects, Resizing and Scaling an Object

**Unit 2: Presentation of Slides**

Viewing A Presentation, Choosing a Set Up for Presentation, Printing Slides And Handouts

**Unit 3: Slide Show**

Running a Slide Show, Transition and Slide Timings, Automating a Slide Show

**PRACTICAL**

**Total marks: 20**

**Internal Assessment**

**Total marks: 20**

## **Paper: CAP-VC-3036- Tally**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

### **THEORY**

**Total marks: 60**

#### **Unit 1: Accounting**

Introduction - Definition, function, objective, need, advantage, events and transaction, double entry system of book keeping.

Books of accounts - classification of books of accounts, meaning of journal, journalizing of transactions, ledger and ledger posting, closing of books of accounts and preparation of trial balance.

Cash book - single column, double column and triple column; depreciation.

Financial statements - Trading, Profit and Loss Account and Balance Sheet.

#### **Unit 2: Introduction – Versions of Tally, Features of Tally, ERP Features, Data Directory, and Tally switching between screen areas.**

Company creation:-Create/ Alter/Select/Close/Delete. Introduction on F11 features & F12 configuration.

#### **Unit 3: Basic Accounting: - Accounting Info**

Ledger/Group(Single& Multiple) Create/Display/Alter/Delete.

#### **Unit 4 : Accounting Voucher:- Types of Voucher, Configuring Voucher, Voucher Creation, Entering/Altering & Deleting.**

#### **Unit 5 : Basic of Tally Inventory:-“Integrated A/c with Inventory” Create/Display/Alter/(Single & Multiple) : Group, Category, Godown, Units (Simple/Compound)**

#### **Unit 6 : Invoicing :-Purchase & Sales in Invoice format, Debit Credit notes/Discount/Description**

Inventory Voucher

### **PRACTICAL**

**Total marks: 20**

#### **Internal Assessment**

**Total marks: 20**

## **Semester IV**

Paper: CAP-VC- 4016: **DTP with Corel Draw**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

### **THEORY**

**Total marks: 60**

#### **Unit 1: Getting Started with Corel DRAW**

Case Study: Visiting Card

Understanding the Color Palette

Case Study: Sticker

Case Study: Letterhead with Logo

#### **Unit 2: Working with the Objects**

Case Study: Wedding Card

Case Study: Flex Banner

#### **Unit 3: Understanding other controls (Layers and Tables)**

Case Study: Flyer with Coupon

Case Study: Brochure

#### **Unit 4: Other Features**

Case Study: Product Box Package

Case Study: Book Cover

Case Study: Newspaper advertising

Case Study: Magazine Inner page

### **PRACTICAL**

**Total marks: 20**

### **Internal Assessment**

**Total marks: 20**

## **Paper: CAP-VC-4026- Web designing and Programming**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

### **THEORY**

**Total marks: 60**

**Unit 1: Internet and WWW:** What is Internet?, Introduction to internet and its applications, E- mail, telnet, FTP, e-commerce, video conferencing, e-business. Internet service providers, domain name server, internet address World Wide Web (WWW) : World Wide Web and its evolution, uniform resource locator (URL), browsers - internet explorer, netscape navigator, opera, firefox, chrome, mozilla. Search engine, web saver - apache, IIS, proxy server, HTTP protocol.

**Unit 2: HTML and Graphics :** HTML Tag Reference, Global Attributes, Event Handlers, Document Structure Tags, Formatting Tags, Text Level formatting, Block Level formatting, List Tags, Hyperlink tags, Image and Image maps, Table tags, Form Tags, Frame Tags, Executable content tags.

**Unit 3: Image maps:** What are Image maps? Client-side Image maps, Server-side Image maps, Using Server-side and Client-side Image mpas together, alternative text for Image maps,

**Tables:** Introduction to HTML tables and their structure, The table tags, Alignment, Aligning Entire Table, Alignment within a row, Alignment within a cell, Attributes, Content Summary, Background color, Adding a Caption, Setting the width, Adding a border, Spacing within a cell, Spacing between the cells, spanning multiple rows or columns, Elements that can be placed in a table, Table Sections and column properties, Tables as a design tool

**Frames :** Introduction to Frames, Applications, Frames document, The <FRAMESET> tag, Nesting <FRAMESET> tag, Placing content in frames with the <FRAME> tag, Targeting named frames, Creating floating frames, Using Hidden frames,

**Forms :** Creating Forms, The <FORM> tag, Named Input fields, The <INPUT> tag, Multiple lines text windows, Drop down and list boxes, Hidden, Text, Text Area, Password, File Upload, Button, Submit, Reset, Radio, Checkbox, Select, Option, Forms and Scripting, Action Buttons, Labelling input files, Grouping related fields, Disabled and read-only fields, Form field event handlers, Passing form data

**Style Sheets :** What are style sheets?, Why are style sheets valuable? Different approaches to style sheets, Using Multiple approaches, Linking to style information in s separate file, Setting up style information, Using the <LINK> tag, embedded style information, Using <STYLE> tag, Inline style information

**Unit 4: Java Script:** Introduction, Client-Side JavaScript, Server-Side JavaScript, JavaScript Objects, JavaScript Security,

**Operators:** Assignment Operators, Comparison Operators, Arithmetic Operators, % (Modulus), ++ (Increment), -- (Decrement), -(Unary Negation), Logical Operators, Short-Circuit Evaluation, String Operators, Special Operators, ? (Conditional operator), ,(Comma operator), delete, new, this, void

**Statements:** Break, comment, continue, delete, do ... while, export, for, for...in, function, if...else, import, labelled, return, switch, var, while, with,

**Core JavaScript (Properties and Methods of Each) :** Array, Boolean, Date, Function, Math, Number, Object, String, RegExp

**Document and its associated objects :** document, Link, Area, Anchor, Image, Applet, Layer

**Unit 5: Events and Event Handlers :** General Information about Events, Defining Event Handlers, event, onAbort, onBlur, onChange, onClick, onDbIclick, onDragDrop, onError, onFocus, onKeyDown, onKeyPress, onKeyUp, onLoad, onMouseDown, onMouseMove, onMouseOut, onMouseOver, onMouseUp, onMove, onReset, onResize, onSelect, onSubmit, onUnload

### **PRACTICAL**

**Total marks: 20**

### **Internal Assessment**

**Total marks: 20**



## **Paper: CAP-VC- 4036- INTRODUCTION TO PROGRAMMING**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

### **THEORY**

**Total marks: 60**

#### **Unit 1: Introduction to C:**

Steps for Problem Solving, Algorithm, Analysis of Algorithm Efficiency, Flowchart , Pseudo code, Program , Programming Languages , Translators

History of C , Features of C, Structure of a C Program, Writing a C Program, Compiling and Run a C Program, Syntax and Semantic Errors, Linker Errors, Logical and Runtime Errors, Execution Process

#### **Unit 2: Variables and Constants:**

Character Set, Identifiers and Keywords, Rules for Forming Identifiers , Data Types and Storage Classes in C, Variables , Declaring Variables, Initializing Variables, Constants, Types of constants

#### **Unit 3: Expressions and Operators:**

Assignment Statements, Unary and Binary Operators , Arithmetic Operators, Relational Operators , Logical Operators, Comma and Conditional Operators, Type Cast Operator, Size of Operator, Precedence of Operators

Control Statements, Decision Control Statements:: The if Statement , The switch Statement, Loop Control Statements:: The while Loop , The do-while Loop ,The for Loop, The Nested Loop, The Goto Statement, The Break Statement, The Continue Statement

#### **Unit 4: Arrays:**

Definition , Syntax of Array Declaration and Initialization, Subscript, Processing the Arrays , Multi-Dimensional Arrays, Declaration and Initialization of Two-Dimensional Array, Processing of Two Dimensional Arrays, Representation of Matrix using Two Dimensional Array

#### **Strings:**

Character Arrays, Declaration and Initialization of Strings, Array of Strings, Library String Functions: strlen , strcpy , strncpy , strcmp , strncmp , strcmpi , strnicmp , strcat , strncat , strlwr ,strupr , strrev , strdup , strchr , strset , strnset , strstr

#### **Functions:**

Definition , Structure of a Function , Function Declaration , Function Definition , Formal parameter , Actual parameter ,The Return Statement , Function Prototypes , Recursive Function, Function Calling: Call by value and Call by address

#### **Structures and Unions:**

Declaration and Initialization of Structures, Accessing the Members of a Structure , Structures as Function Arguments , Structures and Arrays , Unions , Initializing an Union, Accessing the Members of an Union

#### **Pointers:**

What is Pointer , Address and Indirection Operators , Pointer Type Declaration and Assignment,

Pointer to a Pointer , Null Pointer Assignment , Pointer Arithmetic, Passing Pointers to Functions , Arrays and Pointers , Array of Pointers , Pointers and Strings

**Unit 5: The C Preprocessor and Command Line Arguments:**

Definition, Macros in C, #define, #include, #ifdef, Other Preprocessor Commands, Predefined Names Defined by Preprocessor

Command Line Arguments in C, Structure of Programs that use Command-Line Arguments, Accessing Command-Line Arguments

**Unit 6: Files:**

Definition, File Handling in C Using File Pointers, fopen( ) , fclose( ) , Input and Output using file pointers , Character Input and Output in Files, String Input / Output Functions , Formatted Input / Output Functions , Block Input / Output Functions, Sequential Files, Random Access Files , Positioning the File Pointer

**PRACTICAL**

**Total marks: 20**

**Internal Assessment**

**Total marks: 20**

## **Skill Enhancement Paper**

### **Semester III**

#### **1. CAP-SE-3014- Basics of Adobe PageMaker**

Total Lectures: 40; Credits: 4

#### **THEORY**

**Total marks: 60**

##### **Unit 1: Pagemaker basics:**

Starting PageMaker, PageMaker Window Elements, Viewing the Page, Floating Palettes, Toolbox, Using the Zoom Tool, Using the Rulers, Displaying the Rulers, Using the Revert Feature.

##### **Unit 2: Working with a publication:**

Opening a Publication, Creating a New Document, Setting the Margins, Setting the Page Size, Setting the Page Orientation, The Page Icons, Displaying Master Pages and Master Page Items, Inserting and Removing Pages, Inserting a Page, Removing a Page, Setting Page Numbers, Saving a New Document, Saving an Existing Document, Saving a Document as Another Document, Closing a Document.

##### **Unit 3: Drawing tools:**

The Line Tool, The Oval Tool, Rectangle Tool, Polygon Tool, Changing the Shape of Rectangle, Changing Strokes and Fills, Deleting an Object, Duplicating an Object.

##### **Unit 4: The text tool:**

Introduction, Using the Text Tool, Creating Text From Scratch, The Manual Text Icon, The Autoflow Text Icon, Text Blocks, Sizing and Positioning Text Blocks, Editing and Manipulating Text, Threading and Unthreading Text, Threading Additional Text, Threading Text to a Different Page, Unthreading Text Blocks, Rethreading Text Blocks.

##### **Unit 5: Importing graphics:**

Introduction, Placing Graphics, Placing in-Line Graphics, Converting an Independent Graphic to an In-Line Graphic, Aligning In-Line Graphics, Sizing Graphics, Cropping Graphics, Object Linking and Embedding (OLE), Setting Up an OLE Liked Object, Embedding an OLE Object, Text Wrap.

#### **PRACTICAL**

**Total marks: 20**

#### **Internal Assessment**

**Total marks: 20**

## Semester IV

### Paper: CAP-VC- 4014: HARDWARE

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

#### **THEORY**

**Total marks: 60**

#### **Hardware**

##### **UNIT I**

Evolution of computer system, Modern computer, Classification of computer, Personal Computer hardware: Monitor, Keyboard, Mouse, Scanner, printer, speaker

##### **UNIT II**

Hard Disk Drive: logical structure and file system, FAT, NTFS. Hard disk tools: Disk cleanup, error checking, de fragmentation, scanning for virus, formatting, installing additional HDD. New trends in HDD. Floppy Disk Drive

##### **UNIT III**

Optical Media, CDROM, drive speed, buffer, cache, CD-r, CD-RW, DVD ROM, DVD technology, preventive maintenance for DVD and CD drives, New Technologies. Driver installation, Writing and cleaning CD and DVD.

##### **UNIT IV**

Processor: Intel processor family. Latest trends in processor, Motherboard, Sockets and slots, power connectors. Peripheral connectors. Bus slots, USB, pin connectors. Different kinds of motherboards. RAM, different kinds of RAM. RAM up gradation. Cache and Virtual Memory (only concept will be given without going into implementation details)

##### **UNIT V**

SMPS. BIOS. Network Interface Card, network cabling, I/O Box, Switches, RJ 45 connectors, Patch panel, Patch cord, racks, IP address.

#### **PRACTICAL**

**Total marks: 20**

#### **Internal Assessment**

**Total marks: 20**

## Semester V

### CAP-SE-5014- COMPUTER ORGANIZATION AND ARCHITECTURE

Total Lectures: 40; Credits: 4

#### **THEORY**

**Total marks: 60**

##### **Unit – I**

###### **Introduction**

Functional units of a computer, basic instructions (zero, one, two, three address), bus structure, memory locations, memory addresses, memory operations, instruction and instruction sequencing (straight line sequencing and branching). Addressing modes, stack, subroutine, I/O instructions.

##### **Unit – II**

###### **Register Transfer Logic**

Introduction, inter register transfer, arithmetic micro-operation, logic micro-operation, shift micro-operation, Conditional control statements, fixed point binary data, instruction code, design of a simple computer.

##### **Unit – III**

###### **Processor Logic Design**

Processor organization, design of arithmetic and logic circuit, status register, design of accumulator.

##### **Unit – IV**

###### **Control Logic Design**

Hardware control, micro-programmed control block diagram.

##### **Unit – V**

###### **I/O Subsystem**

Program controlled I/O, Interrupts: enabling and disabling interrupts, handling interrupts from multiple sources (priority control), DMA.

##### **Unit – VI**

###### **Memory Subsystem**

Semiconductor memory, SRAM, DRAM, ROM types, Cache memory, Flash memory, mapping functions.

#### **PRACTICAL**

**Total marks: 20**

##### **Internal Assessment**

**Total marks: 20**

## Semester VI

Paper: CAP-SE-6014- **DATABASE MANAGEMENT SYSTEM**

Total Lectures: 40; Credits: 4

### **THEORY**

**Total marks: 60**

#### **UNIT I**

##### **Introduction**

Data, Database, Database management system, Characteristics of the database approach, Role of Database administrators, Role of Database Designers, End Users, Advantages of Using a DBMS and When not to use a DBMS.

**DBMS Architecture:** Data Models – Categories of data models, Schemas, Instances, and Database states. DBMS Architecture and Data Independence – The Three schema architecture, Data independence. DBMS Languages and Interfaces. Classifications of Database Management Systems.

#### **UNIT II**

##### **Data Modeling Using Entity-Relationship Model**

Using High Level Conceptual Data Models for Database Design, Example Database applications. Entity types, Entity Sets, Attributes and Keys. Relationships, Relationship types, Roles and Structural constraints. Weak Entity Types and Drawing E- R Diagrams.

**Index Structures for Files:** Single Level Ordered Indexes – Primary indexes, Clustering indexes and Secondary indexes. Multi-level indexes, Hashing concepts.

#### **UNIT III**

##### **Relational Data Model**

Relation, Integrity constraints - domain, entity and Referential integrity constraints, Basic Relational Algebra operations, select, project and join operations.

##### **Database Design**

Functional dependencies and Normalization for Relational Databases - Normalization concepts, first, second, third normal forms, Boyce-Codd normal form. Functional dependency diagram and design of relational database from it

#### **UNIT IV**

##### **SQL**

SQL data definition and data types, specifying constraints in SQL, schema change statements, SQL constructs (Select ... From... Where... Group by ..... Having... Order by.... Exists.... Not Exists), Insert, Delete, Update, View, Definition and use, nested queries, Constraints considers(NOT NULL , UNIQUE, Check , Primary key. Foreign key, Default)

Introduction to PL/SQL(basic concept).

## **UNIT V**

### **Transaction Processing Concepts and Concurrency Control Techniques**

Transaction and System concepts – Desirable properties of Transactions – Schedules and Recoverability. Lock-Based Protocols – Locks, Granting of Locks, and Two phase locking protocol and implementation of locking

### **Data Base Administration**

Introduction to Database security issues, Discretionary Access Control Based on Granting/Revoking of Privileges and Multi-level security, Database recovery concepts.

## **PRACTICAL**

**Total marks: 20**

### **Internal Assessment**

**Total marks: 20**

## **Discipline Specific Elective paper**

### **Semester V**

#### **Paper: CAP-VE-5016- Basic networking concepts**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

#### **THEORY**

**Total marks: 60**

##### **UNIT I**

Network topologies:  
LAN, WAN, MAN, PAN, CAN.  
Networking Model  
The OSI model  
TCP/ IP Model 2.3 Network adapters.  
Introducing protocols.  
Cabling and troubleshooting.

##### **UNIT II Introduction to various networking devices**

**Installation and setting of networking devices-** Routers, Switches, Modems, Hubs etc.,  
Wired and Wireless technology.

**Network basic and configuration-** Setting IP addresses, Sharing files and folders, Network troubleshooting, PING test, ip config etc.

**Introduction to servers and network security-**

**Types of servers:** Files servers, Email Servers, Proxy servers etc.

Basics of Internet and Intranet.

##### **Types of Internet connections:**

\* Dialup, Broadband, Leased Line, Wi-Fi, WiMax, 2G, 3G, 4G, WWW, E-mails, Search Engines, Social Networking.

\* Cloud application.

\* Audio-video Conferencing.

\* Voice over Internet Protocol (VOIP).

Recovery and backup.

Essential security measures.

#### **PRACTICAL**

**Total marks: 20**

#### **Internal Assessment**

**Total marks: 20**



**Paper: CAP-VE-5026- JAVA PROGRAMMING**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

**THEORY**

**Total marks: 60**

**Unit I**

**JAVA language basics**

Basic features, Java virtual machine concepts Creation of JAVA, executing a java program using command line arguments

The primitive data types and Variables, Java Key words, integer and floating point data type, character and Boolean types, declaring and initialization variables, Type conversion and casting

**Unit II**

**Operators and Control Statements**

Java operators - Arithmetic operators, Bitwise operators, Relational operators, Boolean logical operators, Assignment operator, Conditional operator, if and switch statements, iteration statements, jump statements.

**Unit III**

**Classes and Methods**

Class fundamentals, Objects, Constructors, this keyword, finalize () method  
Overloading methods, garbage collection, Returning objects, introducing access control, understanding static, introducing final, introducing nested and inner classes

**Strings**

String operations, Character Extraction, Comparing, Searching & Modifying the strings, Data conversion using valueOf(), String Buffer

**Unit IV**

**Inheritance**

Inheritance basics, using super,creating a multilevel hierarchy, method overriding, dynamic method dispatch, using abstract classes, using final with inheritance

**Packages and interfaces**

Packages, access protection,importing packages, interfaces

**Multithread programming**

The JAVA thread model, creating a thread, creating a multiple thread, Using isAlive() and join (), Interthread communication, suspending, resuming and stopping threads, using multithreading.

## **Unit V**

### **Exception handling**

Exception handling fundamentals, exception types, uncaught exceptions, using try and catch, multiple catch clauses, nested try statements, throw, throws, finally, Java's built-in exceptions,

### **Input/output**

Java I/O classes and interfaces, file, the stream classes, byte streams, character streams, console class.

### **Applet class**

Applet basics, applet architecture, simple applet skeleton, applet displaying methods,

### **Event handling**

Two event handling mechanisms, delegation event model, event classes, source of events, event listener interface

## **PRACTICAL**

**Total marks: 20**

### **Internal Assessment**

**Total marks: 20**

**Paper: CAP-VE-5036: Concept of computing, data and information**  
Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

**THEORY**

**Total marks: 60**

**Applications of IECT**

e-governance  
Entertainment

**Bringing computer to life**

Connecting keyboard, mouse, monitor and printer to CPU  
Checking power supply

**PRACTICAL**

**Total marks: 20**

**Internal Assessment**

**Total marks: 20**

## Semester VI

Paper: CAP-VE-6016- **OBJECT ORIENTED PROGRAMMING USING C++**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

### **THEORY**

**Total marks: 60**

#### **UNIT I**

##### **Introduction to object oriented programming.**

Origins of C++- Basic Concepts of Object Oriented Programming-Benefits of OOP-Applications of OOP.

##### **Introduction to c++**

Structure of a Simple C++ program-Output operator-Input operator-Cascading of I/O operators. Tokens- keyword, identifiers, constants, strings and operators. Basic data types-User defined data types-Dynamic initialization of variables-Reference variables-Operators in C++-Scope resolution operator-applications-Member dereferencing operators-Memory Management operators-new and delete.

**Control Structures**-simple if, if else, nested if, switch, while do, break and continue statements. Introduction to Functions-Function Prototyping-Call by reference-Return by reference-Inline functions-Default arguments-Const arguments.

#### **UNIT II**

##### **Classes and objects**

Introduction - Defining a class-Class Vs structures-Creating objects-Accessing class members-Defining member functions-Outside the class definition-Inside the class definition-Outside functions as inline-Nesting of member functions-Private member functions-Memory allocation for objects- Array-Declaring an array-accessing elements of an array-Array of objects. Friendly functions.

##### **Constructors and destructors**

Basic Concepts of constructors-Default constructor-Parameterized constructor-Multiple constructors in a class-Constructor with default arguments-Dynamic initialization of objects-Copy constructor- Dynamic constructors-Destructors.

#### **UNIT III**

##### **Function and operator overloading**

Overloading Concepts Function Overloading: Functions with different sets of parameters, default and constant parameters. Rules for overloading operators-Defining operator overloading-Overloading Unary operators-Prefix and Postfix operators overloading-Overloading Binary operators-Overloading relational operators-Overloading using friend functions-Overloading subscript operator. Pitfalls of operator overloading, Type conversion-Basic to

Class-Class to Basic

#### **UNIT IV**

##### **Inheritance**

Introduction-Defining derived classes-Types of inheritances-Single-Making a private member inheritable-Multilevel inheritance-Multiple inheritance-Hierarchical inheritance-Hybrid inheritance- Virtual base classes-Abstract classes-Constructors in derived classes-Nesting of classes.

**Virtual functions and run time polymorphism**-Introduction-Compile time and Runtime polymorphism-Pointers to objects-this pointer-Pointer to derived classes-Virtual functions-Rules for virtual functions-Pure virtual functions.

#### **UNIT V**

##### **Streams**

C++ stream classes-put() and get() functions-getline() and write() functions-Overloading << and >> operators-Formatted Console I/O operations-ios class functions-width(),precision(),fill(),setf() and unsetf()-Formatting flags-Manipulators-User defined manipulators.

#### **UNIT VI**

##### **Files**

Introduction-Stream classes for files-Opening files using constructor-Opening files using open()-File modes-Detecting end of file-eof()-Sequential input and output-put() and get()-Reading and writing objects-read() and write()-Random Access files-Manipulating file.

**PRACTICAL**

**Total marks: 20**

**Internal Assessment**

**Total marks: 20**

## **Paper: CAP-VE-6026- OPERATING SYSTEM**

Total Lectures: 40; Credits: 6 (Theory – 4, Practical - 2); Total marks: 100

### **THEORY**

**Total marks: 60**

#### **Introduction**

Basics of Operating Systems: Definition – Generations of Operating systems, Types of Operating Systems (definition only): Mainframe, Batch, Multiprocessor, Distributed, Multitasking, Real time, Parallel and Time sharing.

#### **Processes**

Process: Concept of a Process, Process States, Process creation, Process termination, Context switching, Thread: Concept of thread, Design issues of thread, Types of threads, Benefits of threads Basic Concept of multithreading.

#### **Process Synchronization**

Basic concept of Inter-Process communication, Race condition, Critical-Section, Mutual exclusion, semaphore, mutex. Different ways to achieve mutual exclusion- Disabling interrupt, Test-and-Set- Lock, Peterson's solution using semaphore. Brief discussion on classical IPC problem (example- Dining philosopher problem).

#### **Scheduling**

Basic Concepts of scheduling, Scheduling objectives, preemptive and non preemptive scheduling, Scheduling criteria – CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time , Basic concepts on batch, interactive and real-time scheduling algorithm, Scheduling algorithms- FCFS, SJF, RR, priority scheduling, Goals of scheduling algorithms

#### **Deadlocks**

Definition, Deadlock characteristics , Methods for Handling Deadlocks, Deadlock Prevention , Deadlock detection and Recovery, Deadlock Avoidance using Banker's Algorithm.

#### **Memory management**

Memory allocation in Multiprogramming, Relocation and Protection, Swapping, Virtual memory: - Basics of Virtual Memory, Logical versus Physical address space, Paging and Concept of Segmentation, Page fault, Page table and its entries, Demand paging, TLB, Page replacement algorithms: - LRU, Optimal, NRU, FIFO, Second chance, Clock, NFU, Working set.

#### **File system**

File concepts, File naming, File types(directory, regular, device), File attributes, Operations on file, Access Methods – Sequential, Random access, Directory in UNIX, Hierarchical

directory structure, Relative path and Absolute path, Operation on directories, Disk layout, Disk partition, File system layout, Disk block allocation- Contiguous allocation, Linked list allocation, FAT, i-nodes, File system security

### **I/O management**

Basic principles and overall structure of I/O management subsystem, Device controllers, Layers of the I/O subsystem-interrupt handler's device driver, device independent I/O software and user space I/O software.

**PRACTICAL**

**Total marks: 20**

**Internal Assessment**

**Total marks: 20**

**Paper: CAP-VE-6036- Internship**

Total Credit: 6; Total marks: 100

**Conduct in workplace:** Student will undergo either project supervised by any teacher or industrial in the field of their specialization during the semester of academic year. Evaluation will be done by the department based on the outcome of the project or on feedback received from the concerned management on the student's performance during the tenure.

**Report making and verbal presentation:** After completion of the project, the students will prepare a report on her work and experience. Evaluation will be based on the quality of the report and presentation.

**Project report + Presentation + Viva voce**

**Total marks: 100**