

**GOVT. BILASA GIRLS' P.G. COLLEGE
BILASPUR (C.G.)**

AFFILIATED TO

**ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA
BILASPUR (C.G.)**

SYLLABUS

B. Sc. Computer Science

Semester I –Sem VI

2019-20

GOVT. BILASA GIRLS' P.G. COLLEGE BILASPUR (C.G.)

COMPUTER SCIENCE

Session 2019-20

B.Sc. Part I

Semester-I

Computer Fundamental & PC Packages

Unit – I

Basic of Computer

What is Computer? Introduction to Computing, History of Computer, Application and issues of Computer, Components of Computer; Input device, Output Devices, System Unit, Storage Devices, Connectivity, Video ports, USB port, all other Ports.

Unit – II

Processing Unit

Processor Building Blocks; Control Unit, Arithmetic Logic unit, Register unit, comparison of personal computer processors, processor for mini, mainframe, Large and Super computers, Examples of Various processor and their families, Category of processor on basis of word length, working of processor and Execution process machine cycle system Clock.

Unit –III

Memory and I/O/Devices

Types of memory: RAM, cache, ROM, flash memory, CMOS, Cloud Storage, Optical Discs; CDs, DVDs, memory Hierarchy Input Devices keyboard, Mouse, Trackball, Touchpad, pointing, Stick, and other memory output Devices; LCD & Plasma Monitors, other Monitors Prints: Nonimpact, Ink-Jet, Photo, Laser printer, plotters, Speakers, Headphones and Ear-buds, Data projectors, Interactive whiteboards.

Unit- IV

MS WINDOWS 7 AND MS WORD

Installing WINDOWS, Basic Element of WINDOWS, Working with windows, connecting to the Internet: Dial –up Connections, Broadband Connections, Installing New hard ware & printer, Installing & Removing Software, Power Setting, MS Word: Menus, shortcuts, Document types, working with Document types, Working with Document: Function of tool bar and menu bar. MS power point: Creating new Presentation templates, setting background, Function of Tool Bar and Menu bar, Inserting pictures, Movies, tables, etc into the presentation, Setting Animation& Transition effect, Adding audio and video, Printing Handouts, Generating standalone presentation viewer.

Unit – V

MS Excel and MS Access:

Introduction :- Spreadsheet & its Applications, & Toolbars & icons, Shortcuts, Working with spreadsheet, Computing data Formula, Formatting Spreadsheet, Worksheet: Sheet Formatting & style background, Graphs, printing, worksheet, MS Access: Database concepts: Tables, Queries, Forms, Reports, Opening & Saving database file: Creating Tables, Table Design, Indexing, Entering Data, Importing data, Creating Queries: SQL statement, setting Relationship, Forms: GUI, Form, Creating & Printing reports.

Text Books:-

1. Computer Science: an overview, Brook shear J.G. pearson Education.
2. Fundamental of Computer Raja Raman V..Prentic Hall of India New Delhi.
3. Comdex Computer Course Kit (Windows 7 with office 2010), Gupta Vikas, Dreamtech Publication.
4. Mastering MS Office 2000 professional Edition by Courter,BPB publication.
5. MS Office 2000 Training Guide by Maria, BPB Publication .
6. MS Office Complete by SYBEX.

Reference Book:-

1. PC Upgrade & Repair Black Book by Ron Gilster.
2. Fundamentals of Computers & Information Technology, A. Jaiswal, Dreamtech press.

-----;;;-----

GOVT. BILASA GIRLS' P.G. COLLEGE BILASPUR (C.G.)

Semester - IInd

PROGRAMMING METHODOLOGY WITH C

UNIT- I

Introduction to Program Concept.

Characteristics of Programming Various stages in Program Development, Design of Algorithms, Definition. Features of Algorithms, Criteria to be Followed by an Algorithm, Analysis of Algorithm, Analysis of Algorithm, Efficiency of Algorithm, Algorithm Complexity, Flow charts – Symbols, Rules for making Flow chart Pseudocodes and decision tables, Programming Techniques – Top down, Bottom up, structured programming and modular programming, merits, Demerits, and their Comparative study, Problem-solving Techniques, Step for problem – solving, using computer as a problem - solving Tool, Problem analysis.\

UNIT – II

Introduction to C PROGRAMME

Structure of C program, character set, C Tokens, keyword, identifiers, constants, variables, data types, Types of operators and expressions, Precedence of arithmetic operator Type conversion in expressions, Operators Precedence input and output Function in C Control Structure – if, If Else, Nesting of If Else, Else If ladder statement, switch statement, Conditional operator, GOTO, Statement Loop Introduction, while Do while, For Loop, jumps in Loop.

Unit III

Arrays, String & Function

Definition Initialization, characteristic One Two and Multidimensional Arrays, string – Introduction, working with String & standard Function –Introduction, Need for user defined Function, From of C Function, Return value and their types, Declaration, Prototypes, Category of function, function with arrays, call by value and feference, The Scope and lifetime of variables in Function.

Unit- IV

Structure, Union& Pointers

Declaration:- Initialization, Arrays of structure, Structure within Structure, Structure and Function Union Size of Structure , Bit Fields pointer –Introduction, Declaring and initializing Pointer Accessing a variable pointer expression. Pointer and arrays, pointer and character string Pointer and Function, pointer and structure , pointer to pointer.

Unit – V

File management

Introduction , Defining and operating a file Closing a file , Streams and file types , file operator file I/O read, with and other standard function of file, random access to file, Dynamic memory Allocation, The preprocessor.

Text Book:-

1. LET US C, Yeshwant Kanetkar, BPB PUBLICATIONS.
2. The Complete Reference C Herbert Schildt, Tata McGraw HILL.
3. PROGRAMMING IN ANSL C- by E. Balgurusamy- Tata McGraw HILL.
4. PROGRAMMING WITH C Byron Govfred, Tata McGraw HILL.

Reference Book:-

1. The “C” Programming Language, Brian W. Kenigham & Dennis Ritchie, Pearson.
2. Mastering “c” – Crain Bolon.
3. The Spirit of “c” Henry Mulish, Herbert. L. Cooper.
4. Gottfried, Schaums Outline Series, “Programming with C” TMH Publications .
5. Peter Juliff, “Program design” PHL Publication.

Programming Lab in ‘C’ & PC Packages

List of C Programs.

1. Program to Find area and circumference of Circle.
2. Program to Find the simple interest.
3. Program to Convert temperature from degree centigrade to Fahrenheit.
4. Program to print Fibonacci series up to 100.
5. Program to find GCD & HCF of given Numbers using Recursion.
6. Program to find whether given no is a prime no or not.
7. Program to display sum of series $1 + 1/2 + 1/3 + \dots + 1/n$.
8. Program to display series and find sum of $1 + 3 + 5 + \dots + n$.
9. Program to use bitwise and operator between the two integers.
Program to add two number using pointer.
Program to find sum, subtraction, Multiplication & Transpose of Matrices.
Program to reverse a number using pointer.
Program to show input and output of a string.
Program to find square of a number using function.
Program to swap two number using function.
Program to find factorial of a number using function.
Program to show Table of a number using function.
Program to show call by value.
Program to show call by reference.
Program to find largest of two number using Function.
Program to Find Factorial of a number using recursion.
Program to Find whether a string is palindrome or not.

PC- Package LAB:-

The Lab Exercise should be based on mswindows 7 of sharing version and ms office 2007 of higher version and comprises the theoretical paper as well as practical paper.

Section:-A

WINDOWS 7 :- Basic Elements of WINDOWS, My Computer, Sharing Devices, windows Explorer, Accessories: Entertainment, Communication, System Tools paint, Brush, Calculator, Calendar, Clock, Note pad, word pad, Etc., Control panel, Changing Color and Theme, Changing the Desktop Background, Screen Saver, Adjusting Display Settings, Adjusting Sound, Changing the Date and Time.

Section :- B

Introduction to MS word :- Menus, Shortcuts, Document types, Working with Document :Operating File –New &Existing, Saving file, Formatting page and Setting margins, Converting file to different Formats – Importing Exporting Sending file other, Editing text document – Inserting, Deleting , Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tools bars, Ruler, -Using Icons, Using Help, Formatting, Document, Setting Font Styles, setting Paragraph style, Setting page Style, Setting.

Section – C

Introduction To MSpower point: Operating New Presentation, Different Presentation templates, Setting Inserting picture, Movies, tables.

Section :- D

Introduction To MS Excel:- Introduction Spreadsheet & its Application, Operating Spreadsheet, Menus & Toolbars & Icons, Shortcuts, Working with Spreadsheet –Operating a file, Saving file saving, File Setting, Setting margins, Converting File to Different Formats – Importing, Computing Data- Setting Formula, Finding total in a Column of row, Mathematical operations, Formulas, Formatting Spreadsheet & printing worksheet.

Section – E

Introduction To MS Access:- Data base Concepts: Tables, Queries, Forms, Reports , Operating & Saving Database file Creating Table, Table Design, Indexing, Entering Data, Importing Data, Creating Queries SQL. Statements, Setting Relationship, Creating Forms: GUL, Form, Creating & Printing Reports.

GOVT. BILASA GIRLS' P.G. COLLEGE BILASPUR (C.G.)

B.Sc. Semester III

COMPUTER SCIENCE

COMPUTER ARCHITECTURE

UNIT-I: Data Representation:

Number Systems - Decimal, Binary, Hexadecimal, Octal. BCD, Conversion from one number system to another number system, binary arithmetic, complements (n-1's and n's), Signed and Unsigned numbers, Addition and Subtraction, Multiplication, representation of negative numbers. Fixed point representation & floating point representation.

UNIT-II: Logic gates, Boolean algebra & Switching functions:

Fundamental postulates of Boolean algebra, Basic theorems and properties, Canonical and Standard forms, Truth Tables, OR, AND, NOT, XOR, Universal (NOR and NAND Gates, Multilevel NAND/NOR realizations, properties of logic gates, Algebraic simplification digital logic gates. DeMorgan's theorem. Standard representation of logic function (SOP and POS), Minimization technique- K Map method, Prime implicants, don't care combinations, Minimal SOP and POS forms, Tabular Method.

UNIT-III: Combinational & Sequential Circuits:

Design using conventional logic gates, Encoder, Decoder, Full Adders, Half Adders, Subtractors, Multiplexer, De-Multiplexers. Basic flip-flops- SR FF, JK-FF, T and D Type FF, Master slave FF, clocked Flip Flop; Triggering and excitation tables.

UNIT-IV: Basic Computer Organization & Design:

Instruction Codes, Computer registers, Common Bus system, instruction cycle, I/O & interrupt,

Programming The Basic Computer

Machine language, Assembly language, One pass and Two pass assemblers, Instruction format, Addressing modes, Type of interrupts, RISC versus CISC architectures.

UNIT-V : Input-Output and Memory Organization:

Peripheral devices, I/O interfaces, asynchronous data transfer, modes of transfer, priority interrupt, DMA, I/O processor. Memory hierarchy, Main and auxiliary memory, Associative memory, cache memory, virtual memory.

TEXT BOOKS:

1. "Computer System Architecture", M. Morris Mano, 3rd Edition, PHI / Pearson, 2006.
2. "Computer Organization and Architecture", William Stallings 7th Edition, PHI/Pearson, 2006.
3. "Switching & Finite Automata theory", Zvi Kohavi, TMH, 2nd Edition.
4. "Digital Design", Morris Mano, PHI, 3rd Edition, 2006.

REFERENCE BOOKS:

1. "Computer Organization", Car Hamacher, Zvonks Vranesic & Safwat Zaky, 5th Edition, TMH, 2002.
2. "Computer Architecture and Organization", John P. Hayes, TMH International Editions, 1998.
3. "Computer Architecture and Organization", Raj Kamal, Nicholas Carter, 2nd Edition, TMH Education, 2009
4. "Introduction to computer architecture", Stones S. Galgotia Publication
5. "Computer Organization and Architecture design for Performance", 4th edition - W. Stallings, PHI
6. "Computer Engineering - Hardware Design", M. Morris Mano, PHI
7. "Computer Architecture and parallel processing", Kai Hwang & Faye Briggs, McGraw hill, 1985
8. An Engineering Approach To Digital Design – Fletcher, PHI.
9. Malvino A.P, Digital Principles and Applications, Tata McGraw Hill.

GOVT. BILASA GIRLS' P.G. COLLEGE BILASPUR (C.G.)

**B.Sc. Semester IV
COMPUTER SCIENCE**

INTRODUCTION TO DATA STRUCTURE AND OOPS

UNIT-I

Introduction, Procedure-Oriented Programming paradigm, Object-Oriented Programming paradigm, Basic characteristics of OOP's: object, class, encapsulation, inheritance, reusability, polymorphism and overloading, static and dynamic binding, message passing, benefits of OOP's and application of OOP's.

UNIT-II

C++ Basics: Overview, Syntax, Comments, Basic Data types, Tokens, identifiers, Keywords, Constants/Literals, Variables, Variable Scope, Modifier Types, Storage Classes, Operator, array, Strings, pointer, References, Date & Time, I/O statements, namespace, Program structure, typecasting, control statements: if statement, if- else statement, nested if-else statement, ladder if-else, switch statement, for loop statement, while loop statement, do-while loop statement.

UNIT-III

Objects and classes : Basics of object and class and abstract class in C++, private and public members, static data and function members, function prototype, inline functions.

Introduction to : function overloading, friend functions, default arguments, constructors and destructors, inheritance and polymorphism.

UNIT-IV

Linear and Non linear data structures, Data structure operations, Algorithmic notations, Complexity of algorithms, Control structures. Memory representation and operations on:

Arrays- One dimensional, Multidimensional arrays.

Linked List- Singly and Doubly Linear link lists, circular linked list

Stack: PUSH, POP, TRAVERSE, implementations using array and linked list,

Applications of stack: Infix, Prefix, Postfix representation and conversion using stack, Postfix expression evaluation using stack, use of stack in recursion, Polish notation.

Queues: Priority Queue, Deques

UNIT V

Definition of trees and their types, Binary trees, Properties of Binary trees and Implementation operation (Insertion, deletion, searching and traversal algorithm: preorder, post order, in-order traversal), Definition of Binary Search Trees, AVL Trees, B trees, multi way search trees.

Sorting: Sequential Sort, Insertion Sort, Selection Sort, Bubble Sort, Quick Sort, Merge Sort, Heap Sort, Radix sort.

Linear or sequential search, Binary search.

TEXT/REFERENCE BOOKS:

1. "Data structures using C", Tenenbum, PHI, 1996
2. "Fundamentals of Data Structures", Horowitz and Sahani, Computer Science Press, 1978
3. "Data structures and Algorithms", Aefred V. Aho, Jhon E. Joperoft and J.E. Ullman.
4. "An Introduction to Data Structures with Applications", Jean Paul Trembley and Paul Sorenson, TMH, International Student Edition, 1985
5. "Data Structures and Program Design in C", R. Kurse, Leung & Tondo, 2nd Edition, PHI publication
6. Data Structures, Seymour Lipschutz, Schaum's Outlines, TMH.

TEXT/REFERENCE BOOKS:

1. "Object-Oriented Programming with C++", E. Balaguruswamy, TMH
2. "C++ The Complete Reference", Herbert Schildt, Osborne, TMH, latest
3. "Object-oriented programming with C++", Robert Lafore, Macmillan computer
4. "Tech yourself C++", Herbert Schildt, Osborne, TMH
5. "C & C++ Complete reference", Herbert Shieldt, Osborne, TMH
6. "Object-Oriented programming in C++", Nabajyoti Barkakati, PHI
7. "C++ Primer Plus", Stephen Prata, Galgotia Publications, 1996
8. "Object-Oriented analysis and Design with applications", Grady Booch

Programming Lab in c++ and Data Structure

C++ Lab

1. Write a c++ program for finding greatest of three numbers.
2. Write a c++ program for solving the quadratic equation.
3. Write a c++ program to print all the prime numbers in the given range.
4. Write a c++ program for displaying the Fibonacci series.
5. Write c++ function for swapping two numbers without using third variable.
6. Write your own function for string reverse, string palindrome, string comparison.
7. Write a c++ program for sorting the number in ascending and descending order.
8. Write a c++ program for matrix addition and multiplication.
9. Write a c++ program for copy constructor and dynamic initialization of constructor.
10. Write a c++ program for array of pointers to objects.
11. Write a c++ program operator overloading using friend function.
12. Write a c++ program different types of inheritance using virtual base class.
13. Write a c++ program for run time polymorphism.
14. Write a c++ program to perform sorting using generic function(template).

Data Structure Lab

Linked List

1. Implementation of Linked List menu driven Program.
2. Representation of Sparse matrix using multi Linked Structure. Implimentation of Sparse matrix multiplication.
3. Implementation of polynomials operations(addition, subtractions) using Linked List.
4. Implementation of Double Ended Queue using Linked List.
5. Implementation of priority queue program using Linked List.

Stack

1. Implementations of stack menu driven program.
2. implementation of multistack in one array.
3. Implementation of infix to post fix transformation and its evaluation program.
4. Implementation of infix to prefix transformation and its evaluation program.
5. Simulation of recursion.

Queue

1. Implementation of circular queue menu driven program.
2. Implementation of queue menu driven program.
3. Implementation of priority queue program using array.

Tree

1. Implementation of binary tree menu driven program.
2. Implementation of binary tree traversal program.
3. Implementation of construction of expression tree using postfix expression.
4. Implementation of B tree menu driven program.
5. Implementation of B+ tree program.
6. Implementation of preorder traversal of a threaded binary tree.

Sorting and Searching program

GOVT. BILASA GIRLS' P.G. COLLEGE BILASPUR (C.G.)

**B.Sc. Semester V
COMPUTER SCIENCE**

SYSTEM ANALYSIS AND DESIGNING

UNIT-I

The system concept, Characteristics of a system, Elements of a system, types of system. Introduction to system development life cycle, Recognition of need, Skills and Role of system Analyst, Introduction to system analysis, Initial Investigation, determining the users information requirements, problem definition.

UNIT-II

Introduction to structured analysis, fact-finding, the tools of structured analysis, Feasibility study, Cost/Benefit analysis.

UNIT-III

Introduction to system designs, The process of design (logical and physical design), Design methodology, structured design, structured walkthrough, Major development activities, Data validation, Introduction to input design, output design, forms design, File structure, File organization, Data Base design, and the role of DBA.

UNIT-IV

The Test Plan, Quality assurance, System Conversion, Software maintenance, Procedure for Hardware/Software selection, Project Management and Control, Project Control, Gantt Chart, PERT and CP M, System Security.

UNIT-V

Abstract view of components of computer system, Functions of operating system, Evolution of operating system, Batch, Time sharing, Real time operating system, Multiprogramming, Multiprocessing, Multiuser, Multiaccess. Introduction to UNIX.

TEXT BOOKS:

1. System Analysis and Design, Elias. M. Awad, Galgotia Publication.
2. Fundamentals Of Computers, V. Rajaraman, PHI.
3. "Operating Systems: *Concepts & design*" Milan Milenkovic, , TMH
- 4.

REFERENCE BOOKS:

- Kendall and Kendall, System analysis and Design, PHI.
- Igor Hawryskiewicz, Introduction to System analysis and Design, PHI

GOVT. BILASA GIRLS' P.G. COLLEGE BILASPUR (C.G.)

**B.Sc. Semester VI
COMPUTER SCIENCE**

DATA BASE MANAGEMENT SYSTEMS & WEB TECHNOLOGY

UNIT-1

INTRODUCTORY CONCEPTS: Database system concepts and architecture, Database System Applications, Database systems versus File system, View of data, Data Models, Database Languages(Data definition language and Data Manipulation Language), Database Users and Administrators(Database Users and User Interface),Database Administrator, Database System Structure(Storage Manager, Query Processor), Application Architectures, History of Database Systems.

UNIT-2

Data Models : ER Modeling concepts, Entity Sets, Relationship Sets, Constraints, Keys, Mapping Cardinalities, ER Diagrams,

Extended ER feature,, Weak-entity types, Subclasses and inheritance, Specialization , Generalization and Aggregation, ER to relational mapping, Reduction of an E-R schema to tables. Composite and Multivalued Attributes.

RELATIONAL MODEL : Structure Of relational Databases, Database Schema, Keys, Schema Diagram, Query Languages,

Relational ALGEBRA : Basic Relational Algebra Operation,Select, Project, Union,Cartisan Product, Intersection, Join,Natural join, Division, Tuple and Domain Relational Calculus.

SQL: Parts and structure of SQL, Aggregate Function, Data definition in SQL, Queries and update statements,

Integrity and Security : Domain Constraints, Referential Constraints, Assertions, Triggers, Security and Violations, Authorization, Granting Of Privileges, Notion Of Roles, Audit Trails,

Authorization in SQL,Privilages in SQL, Role, Privilege to Grant Privilages,

Encryption and Authentication.

UNIT-3

DATABASE DESIGN USING THE RELATIONAL MODEL: Functional dependencies: Keys in a relational model, Concept of functional dependencies, Normal forms 1NF, 2NF, 3NF, Boyce-Codd Normal Forms, Multi-values dependencies and fourth normal form, Join dependencies and fifth normal form.

UNIT-4

STORAGE AND INDEXING STRUCTURES: Storage structures Secondary storage devices, Buffering of blocks, File Organization, Heaps, Sorted Files, Hashing and overflow handling techniques, dynamic hashing, Extensible hashing, other file organization and Indexing.

TRANSACTION PROCESSING, CONCURRENCY CONTROL AND RECOVERY TECHNIQUE: Transaction Fundamentals, Transaction State, Shadow copy technique,Concurrent Execution,Serializability, ACID properties

Locks,Lock based Protocols,Two Phase Locking Protocol,Timestamp Based Protocol, Deadlocks and starvation, Two-phase locking (2PL) protocol, Deadlock prevention protocols, Wait-die and wound-wait schemes, Time-out based schemes, Deadlock recovery,

Recovery concepts,Failure classification, Storage Structure, Recovery and Atomicity,Log-Based Recovery, Deferred updates technique, Immediate update technique, CheckPoints,Shadow paging.

UNIT-5

RDBMS software ORACLE: Introduction to Oracle, Data Types, SQL, SQL Plus, Creating DDL & DML : Creating Table, Specifying Integrity Constraint, Modifying Existing Table, Dropping Table, Inserting Deleting and Updating Rows in table, where clause, Order by , GROUP function, SQL function: JOIN, Set Operation, SQL Sub Queries.

Views : Creating, Dropping, and Retrieving data from view.

Security : Management Of roles, Granting Role & Privilege, Drawing Privilege.

PL/SQL : Block structure in PL/SQL, Variable and constants, Data Base Access, Exception Handling, Triggers.

Oracle Complete Reference : Oracle Press.

TEXT/REFERENCE BOOKS:

1. "Fundamentals of Database System", R. Elmasri & S. Navathe
2. "Data Base Management System", Henry F. Korth & Abraham Silberschats, TMH, 1991.
3. "An Introduction to Database Management System", Vol I & II, Date C.J., Addison Wesley, 1981, 1983
4. **UNIT-I**
5. Object Oriented Database: Persistent Programming Language, Object identity and its implementation, Clustering Indexing, Client Server Object Bases Coherence.
- 6.

TEXTBOOKS/REFERENCES:

7. 1. Database System Concepts: Korth And Silberschatz (TATA Mc-Graw Hill)
8. 2. Fundamentals of Database System: R. Elmasri & S. Navathe (Benjamin Cummings)
9. 3. Database Transaction Models for Advanced Applications: Ahmed K. Elmagramid (Morgan Kaufmann)
10. 4. Transaction Processing Concepts and Techniques: J. Gray and A. Reuter
11. 5. Introduction to Object Oriented Databases: Won Kim (MIT Press)
12. 6. Readings in Object Oriented Database System: S. Zdonik and D. Maier (Morgan Kaufmann)
13. 7. Reading in Database Systems: M. Stonebreaker
14. 8. Distributed Database Principles and System: S. Ceri and G. Pelagati (McGraw HILL)

RDBMS & WEB Programming Lab with PHP

RDBMS Lab

1. Practical based on PL/SQL (using oracle)
2. Perform DML and DDL . operations
3. Cursor , Procedure , Trigger

Web programming With PHP

Web application development using PHP