

Department of Computer Sc. & Information Technology (CSIT)
Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G.
Examination Scheme and Syllabus of Integrated UG/PG- CS

1st Sem					
S.NO	Paper Code	Subject	Marks Allotted	End Semester Marks	Internal Marks
1	PCSC-101	Fundamentals of computer	50	30	20
2	PCSC-102	Introduction to Programming Methodology	50	30	20
3	PCSC-103	LAB 1	50	30	20
TOTAL			150	90	60
2nd Sem					
S.NO	Subject Code	Subject	Marks Allotted	End Semester Marks	Internal Marks
1	PCSC-201	Introduction to Logics of Computer	50	30	20
2	PCSC-202	System Analysis & Design	50	30	20
3	PCSC-203	LAB 2	50	30	20
TOTAL			150	90	60
3rd Sem					
S.NO	Subject Code	Subject	Marks Allotted	End Semester Marks	Internal Marks
1	PCSC-301	Introduction to Operating system	50	30	20
2	PCSC-302	Introduction to C Language	50	30	20
3	PCSC-303	LAB 3	50	30	20
TOTAL			150	90	60
4th Sem					
S.NO	Subject Code	Subject	Marks Allotted	End Semester Marks	Internal Marks
1	PCSC-401	Database Management System.	50	30	20
2	PCSC-402	Computer Based Numerical Method.	50	30	20
3	PCSC-403	LAB 4	50	30	20
TOTAL			150	90	60
5th Sem					
S.NO	Subject Code	Subject	Marks Allotted	End Semester Marks	Internal Marks
1	PCSC -501	Internet Application	50	30	20
2	PCSC-502	Objected Oriented Concepts	50	30	20
3	PCSC-503	System Software	50	30	20
4	PCSC-504	Introduction to Artificial	50	30	20
5	PCSC-505	Minor Project	100	100	-----
TOTAL			300	220	80
6th Sem					
S.NO	Subject Code	Subject	Marks Allotted	End Semester Marks	Internal Marks
1	PCSC -601	Programming with JAVA	50	30	20
2	PCSC-602	Software Testing	50	30	20
3	PCSC-603	Introduction to Data	50	30	20
4	PCSC-604	Management Information	50	30	20
5	PCSC-605	Major Project	100	100	-----
TOTAL			300	220	80

Subject – Fundamentals of Computer
Paper Code – PCSC-101

Basics of Computer – Development of computer ,Computer system concepts, Characteristics, capabilities and limitations of computer, Types and generation of computers, Computer architecture.

Input /Output and Storage device – Basic input devices :keyboard, mouse ,joystick ,MICR, OCR. light pen ,Bar Code Reader, Touch screen ,Basic output devices: Printer –Types of printer, Plotter, Monitor VGA, SVGA ,XGA etc.

Storage device : Different types of storage device ,Primary Vs Secondary data storage .

Computer software – Definition ,Software and its need ,types of software :Application software, System software, Firmware, Evolution of programming language ,Different types of programming language :High level ,Assembly level ,Low level and 4GL,their advantages and disadvantages ,language translator: Compiler, Interpreter, Assembler, Booting process.

Data Representation – Number system :Binary ,Octal, and Hexadecimal ,converting from one number system to another ,Computer code:BCD,EBCDIC and ASCII ,Binary arithmetic :Addition ,subtraction, multiplication and division ,

Operating System and other Software – Definition and objective of operating system ,Types of operating system, DOS and Windows ,Characteristics of DOS ,some basic commands of DOS ,Virus : Types of virus ,virus detection and prevention .

Suggested books :

1. Alexis Leon and Mathews Leon ,Fundamental of Information Technology ,Vikas Publication .
2. V.Rajaraman .Computer fundamental ,PHI publication .

Subject - Introduction to Programming Methodology
Paper Code – PCSC-102

Programming Concepts, Characteristics of Programming, Stored Program Concepts, Procedure Oriented Programming, Object Oriented Programming- characteristics & its advantages, Types of Computer Languages (Low Level, High Level, 4GL and Object Oriented Languages).

Programming Tools : Algorithms, characteristics of Algorithm, Program Flow Charts, Pseudo code, Decision Tables, Structured Programming Techniques.

File Concepts, Data Terminology and File Operations : File Organization and Accessing Techniques- Sequential, Direct and Index Sequential.

Software and its Need, Types of Software, System Software and its type, Application Software and its type, Compilers and Interpreters.

Operating System : Introduction to OS, Functions of OS, Broad View of MS-DOS(Internal and External Commands only), UNIX (commands only) and MS-Windows.

Suggested Books:

1. Computer fundamentals: By V.Rajaram; PHI Publication
2. Data Structure : By Shaum Series

Subject – Introduction to logics of computer
Paper Code – PCSC-201

Unit-1

Number Systems and codes: Decimal numbers, binary numbers, binary arithmetic, 1's and 2's complements, Octal numbers, hexadecimal numbers, inter-conversion of number system, Digital codes: Binary coded decimal (BCD) , Gray code, Excess-3 code, Format of ASCII code.

Unit-II

Logic Gates: Positive and negative logics, NOT gate, OR gate, AND gate, NAND gate, NOR gate, EX-OR and EX-NOR gates , Symbol , truth table, Circuit diagram using basic gates , universal property of NAND and NOR gates.

Unit-III

Boolean Algebra: Boolean operation, logic expressing, rules and laws of Boolean algebra, Demorgan's theorems, simplification of Boolean expression using Boolean algebra techniques.

Unit-IV

SOP and POS form of Boolean expressions, minterms, maxterms, and simplification of Boolean expression using Karnaugh map techniques (Up to 4 Variables), half adder, Full adder, Multiplexer.

Unit-V

Flip-Flops, Registers, Shift registers, Counters.

References:

1. Computer Fundamentals , Architecture & Organization By B.Ram, New Age International Publisher limited.
2. Computer Architecture & Organization by Moriss Manno, 3rd edition, Print ice Hall of India Pvt Ltd.
3. Digital Computer electronics: An Introduction to micro computers by Albert Malvino and Jerald Brown, Tata Mcgraw Hill.
4. Mordern Digital Electronics, by R.P Jain, Tata Mcgraw Hill Publication, 3rd Edition.

Subject –System Analysis and Design
Paper code – PCSC-202

System Concepts : What is system, Characteristics of system, Elements of a System, Computer Based System and its Components, Types of Systems: Open and Closed System, Transaction Processing System, MIS, DSS etc.

System Analysis & Requirement Analysis: what is System Analysis, Role and Qualities of System Analyst, System Development Life Cycle- Phases of SDLC, Prototyping- Steps in Prototyping, Advantages and Disadvantages of prototyping?

Requirement Investigation, Feasibility Study, Fact Finding Techniques.

Analysis and Design Tools: Flowcharts, Decision Trees, Decision Tables, Database/File Design, Data Flow Diagrams, E-R Diagrams.

System testing and Implementation : System testing – Black Box Testing, White Box Testing, Unit Testing , Integration Testing, Modular Testing.

What is implementation, Type of Implementation- Fresh, Replacement and Modified, Implementation Methods?

Reference Books:

1. Analysis and Design of Information System: James A Senn
2. System Analysis and Design: Awad

Subject – Introduction to Operating System
Paper code – PCSC-301

Introduction to O.S: Overview of OS , function and goal, characteristics of OS, Hardware Concept related to OS , CPU States, I/O channels , Memory Hierarchy, Types of OS – Multiprogramming, Timesharing, Batch Processing , Multitasking, Real-time.

Concepts of Process: Operation on Process, Process states, Concurrent Processes, Process Control Block(PCB) and signals, Process scheduling, Process Hierarchy.

Process synchronization and Communication: Problem of concurrent processes, Critical section, Mutual Exclusion, Deadlock, Process of Deadlock, Interposes, synchronization, need for interposes synchronization, Buffering and Blocking Process.

Memory Organization and management: Address Binding, Logical and Physical address, Fragmentation, Concept of Virtual memory, Swapping and Relocation.

Preliminary Study of DOS and WINDOWS.

Suggested Books:

1. Silberschatz and Galvin, Operating System Concepts 6/ed, Addison Wesley.
2. William Stalling, Operating Systems: Internals and Design Principles 5/ed, PHI.
3. Tanenbaum, Modern Operating Systems, PHI.
4. Peterson and Silberschatz, Operating System Concepts, Addison Wesley.

Subject -Introduction to C Language

Paper code – PCSC-302

Origin & Introduction to C : About C, Evolution of C, Programming languages, Structure of a C program, Compiling a C program, Simple C program, Character set in C, Keywords in C, Basic data types, Qualifiers used with basic data types, Variables in C, Type declaration, Input function, Output function and format specifiers, arithmetic operators, Unary operators, Relational and logical operators, address operator, conditional operator, Hierarchy of operators.

Decision Making, looping & Branching: Control statements, if statement, if else statement, for statement, while loop, do while loop, switch statement, break statement, continue statement, goto statement.

Arrays & String Handling : Introduction to arrays, advantages of arrays, single dimensional arrays, multidimensional arrays, array declaration, array initialization, accessing data from array, Character arrays, String Variables, Reading & writing strings, string handling functions.

Pointers & User Defined Functions : Introduction to pointers, pointer variables, pointers and arrays, pointers to pointers, array of pointers, 2 dimensional arrays and pointers, Introduction to functions, advantages of functions, declaring a function, calling a function, passing arguments to a function.

File Management in C : Defining & opening a file, closing a file, I/O operations on file, error handling during I/O operations.

Suggested Books:

1. A. K. Saxena, Programming Language C : Anamaya Publishers, New Delhi.
2. Y. Kanetkar, Let Us C, BPB Publication.
3. B.S. Gottfried, Schaum's outline of Theory and Problems of Programming with C, McGraw-Hill.

Syllabus of B.Sc (Computer Science) IV Semester

Subject – Database Management System

Paper code – PCSC-401

Introduction : Purpose of Database System, Concept of database & its evaluation, Views of Data, Types of DBMS, DBMS architecture, Data Independency, Data Models, Data Dictionary.

E-R Model : Basic Concept, Design Issues, Entity Sets, Attributes & its Types, E-R Diagram, Design of an E-R Database Schema , Keys.

Normalization : Purpose of Normalization , Functional Dependencies, 1 NF, 2 NF and 3 NF.

SQL : Introduction to SQL, DDL, DML & DCL statements, Basic Operations, Aggregate function, Modification of Database, other SQL features.

Relational Model : Structure of Relational Model, The Relational algebra (Selection, Projection, Union, Intersection, Cartesian product, Join), Tuple relational calculus.

Suggested Books:

- (1) Database system concepts By H.Korth and A. Silberschatz ,S.Sudarshan, TMH Publication , 2010.
- (2) An introduction to Database Systems by Bipin Desai, Galgotia Publications, 2003 edition.
- (3) An Introduction to Database Systems, C.J.Date, A.Kannan, S. Swamynathan, Pearson Publication, Eight edition, Database Management System C.J.Data

Syllabus of B.Sc (Computer Science) IV Semester

Subject – Computer Based Numerical Method

Paper code – PCSC-402

Algebraic Equation : Bisection Method, Newton – Raphson Method, Regula Falsi Method.

Simultaneous Algebraic Equation: Gauss Elimination Method, Gauss-Jordan Method, Factorization Method, Jacobi's Iteration Method, Gauss- seidal Iteration Method.

Matrix Inversion & Eigen Value : Gauss Jordan Method, Factorization Method , Eigen values and Eigen Vectors .

Interpolation: Newton's backward and forward Interpolation Formula, Lagrange's Interpolation Formula.

Numerical Differentiation & Integration: Trapezoidal Rule, Simpson's one- third rule Simpson's three- eight rule.

Suggested Books:

- 1 Numerical Methods in Engineering & Science By Dr. B.S.Grewal, Khanna Publishers, Seventh edition, 2005.
- 2 Introductory methods of numerical Analysis By S.S.Sastry, Phi Learning publication, Edition Fourth , 2009

Syllabus of B.Sc (Computer Science) Semester - V

Subject – Internet Application

Paper code – PCSC-501

Max Marks-30

Min Marks-12

Basic of Internet: Basic concept, History, Hardware & software requirement, Client server architecture model, IP Address and Domain Name System, Use of Web Browsers, Customizing the browser, Finding information on the Internet, Search Engines, and Basic Protocols: HTTP, FTP, Telnet etc.

Working with Internet: Uploading and Downloading Text and Images, Web Pages and Web sites, Downloading software with the Browser, Installing, Downloading software , Advanced Software Downloading.

Services of Internet: E-mail, Outlook express, Eudora and Netscape Messenger, Advanced E-mail Facilities, Newsgroups: Use and Advantages, Online and e-mail Gaming, Chatting, Videoconferencing, World Wide Web(WWW).

HTML: Benefit and drawbacks, Tables, Frames, Image and Form, Introduction to CGI scripting.

Web Pages: Developing Web page with HTML.

Suggested Books:

1. How to do Everything with the Internet: Dennis Jones.
2. The Internet: Douglas E. Coiner, Prenlicc- Hall, India.
3. Internet & Intranet Engineering : Daniel Minoli, TataMcGraw-Hill.
4. Introduction to Data Communication & Networking : Forouzan.

Syllabus of B.Sc (Computer Science) Semester - V

Subject – Object Oriented Concepts

Paper code – PCSC- 502

Max Marks-30

Min Marks-12

Overview of Object Oriented: Need of Object Oriented, Procedural Vs Object Oriented approach, Benefits, C++ and other languages.

Features of Object Oriented : Class, Objects, Polymorphism, Inheritance, Message Passing, Abstraction, Encapsulation.

Class and Object: Definition, Difference, Pointer to Object, Array of Object, Comparison of Class with Union & Structure.

Polymorphism : Type of Polymorphism, Methods Overloading, Operator overloading,

Inheritance : Types of Inheritance, Single Level, Multi Level, Multiple & Hybrid Inheritance, Advantage of Inheritance, Base Class & Derived Class

C++ & VB: Introduction, Basic Data Type, Writing Simple Program.

Suggested Books:

- 1 Object Oriented Programming: E. Balaguru Swamy, Tata Mc. Graw Hill
- 2 Object Oriented Programming & C++: By R. Raja Raman
- 3 Visual C++ Programming: Yeshwant P. Kanitkar

Syllabus of B.Sc (Computer Science) Semester - V

Subject – System Software

Paper code – PCSC-503

Max Marks-30

Min Marks-12

Basic Concepts: System Software, Types of system software's, SIC (Simplified Instructional Computer), Simple programs for SIC, CISC and RISC machines.

Assembler: Assembler functions, M/C dependent assembler features, M/C independent assembler features, one pass assembler, Multi pass assembler.

Macro and macro processor: Macro definition and expansion, macro processor algorithm and data structure, Independent macro processor features, Macro processor design option.

Compilers and software tools: Phases of Compiler, Software tools for program development, Editors, Debugging, Programming environment, User Interface.

Loader and linkers: Introduction, Basic loader function, Machine dependent loader features, machine independent loader features, Loader design option.

Suggested Books:

- 1 D.M.Dhamdhare, System Programming & Operating Systems, Tata Mc Graw Hill, Second Revised Edition , 1999.
- 2 J. Donovan, Systems Programming : An Introduction to System Programming, Tata Mc Graw Hill Publication, Edition, 1999.
- 3 A.C.Shalini, System Software, Scitech Publications(INDIA) PVT,LTD, Fifth Reprint, 2010

Syllabus of B.Sc. (Computer Science) Semester - V

Subject - Introduction to Artificial Neural Networks

Paper Code – PCSC – 504

Max Marks – 30

Min Pass Marks - 12

Introduction: Definition and meaning, Different areas of A.I. Applications

Preliminaries of Neural Networks: Essence and benefits of neural networks

Introduction to Artificial Neuron: Model of biological neuron, meaning of learning and training, Model of an artificial Neuron, different units of an artificial neuron.

Introduction to Artificial Neural Network: Connectionist Networks, types of neural networks, single layer and multilayer perceptrons, Weights, bias, transfer functions

Training of a simple perceptron: Training of a single layer neural network with simple example like AND, OR logic gates.

Suggested Books-

- i. Neural Networks: A comprehensive Foundation (2e preferred): Simon Haykins, Prentice Hall of India
- ii. Neural Networks for Pattern Recognition: Christopher M Bishop: Oxford Press
- iii. Introduction to Artificial Neural Systems: J.M. Zurada, West Publishing Company, St. Paul, Minnesota, 1992 / Jaico Publishing House, Bombay, 1994
- iv. Artificial Intelligence, E. Rich and K. Knight, Tata McGraw Hill.
- v. Artificial Intelligence: A New Synthesis, Nilsson, Morgan Kaufmann.

Syllabus of B.Sc. (Computer Science) Semester - VI

PCSC – 601 Programming with Java

UNIT I

Introduction: Genesis of java, importance to the Internet, overview and features.

Language Basics: Variables Primitive Data Types Operators Expressions, Statements, and Blocks Control Statements Array class and Object.

Unit II

Inheritance : Definition, Types, Method overloading and Method Overriding, super and this keywords, interfaces.

Packages: Defining Packages, CLASS PATH.

Unit III

Threads: Thread Model, Creating Threads, Synchronization.

Exception handling: Exception Types, Try, Catch & finally Blocks, Throw and Throws

Unit IV

Input/output: Basic Streams, Byte and Character Stream, predefined streams, reading and writing from console and files.

JDBC: JDBC connectivity with backend database, JDBC driver types.

UNIT V

Applets: Fundamentals, life cycle, HTML applet tag, passing parameters.

Introduction to AWT: Window fundamentals, creating windowed programs working with graphics, Using AWT controls, menus. Delegation event model, handling mouse and keyboard events.

Suggested Readings:

1. Naughton P and schildt H. Java: The complete reference, Osborne Mcgra-Hill, Berkeley, USA, 1997.
2. Rodgers Cadenhead, Laura Lemay, Sams Teach Yourself Java 2 in 21 Days, Sams Publishing.
3. E. Balagurusamy, Programming with Java, Tata McGraw Hill.
4. Bruce Eckel, Thinking in Java, Pearson Education.
5. Peter Van Der Linden, Just Java 2, Sun Microsystems/Prentice Hall.
6. Simply JAVA :An Introduction to JAVA programming By James R. Levenick ,Firewall Media publication New,Delhi
7. Java Programming - Khalid Mughal.

Syllabus of B.Sc. (Computer Science) Semester - VI

PCSC – 602 Software Testing

UNIT I

Fundamentals of Testing

Human and errors, Testing and Debugging, Software Quality, Requirement Behavior and Correctness, Fundamentals of Test Process, Psychology of Testing, General Principles of Testing, Test Metrics.

UNIT II

Role of Testing in SDLC

Review of software development models (Waterfall Models, Spiral Model, W Model, V Model) Agile Methodology and Its Impact on testing, Test Levels (Unit, Component, Module, Integration, System, Acceptance, Generic)

UNIT III

Approaches to Testing - I

Static Testing ,Structured Group Examinations ,Static Analysis ,Control flow & Data flow, Determining Metrics

UNIT IV

Approaches to Testing - II

Dynamic Testing ,Black Box Testing ,Equivalence Class Partitioning, Boundary Value Analysis, State Transition Test, Cause Effect Graphing and Decision Table Technique and Used Case Testing.

White Box Testing ,Statement Coverage, Branch Coverage, Test of Conditions, Path Coverage.

UNIT V

Test Management

Test Organization ,Test teams, tasks and Qualifications ,Test Planning ,Quality Assurance Plan, Test Plan, Prioritization Plan, Test Exit Criteria ,Cost and economy Aspects ,Test Strategies, Test Activity Management, Incident Management.

References:

1. Software Testing Foundations, Andreas Spillner, Tilo Linz, Hans Schaefer, Shoff Publishers and Distributors
2. Software Testing: Ron Patton , Techmedia
3. Foundations of Software Testing by Aditya P. Mathur – Pearson Education custom edition 2000
4. Testing Object Oriented Systems: models, patterns and tools, Robert V Binder, Addison Wesley, 1996
5. Software Engineering – A practitioner’s approach by Roger S. Pressman, 5th Edition, McGraw Hill

Syllabus of B.Sc. (Computer Science) Semester - VI

PCSC – 603 Introduction to Data Structure

UNIT I

Introduction, Basic terminology, Elementary data organization, Data structure, Data structure Operation and Types, Order of an algorithm, Complexity of Algorithms.

UNIT II

Array: Basic Terminology, Linear and multi dimensional Array.

Pointers: Array of pointers.

Records: Record Structures.

UNIT III

Linked list: traversing a linked list, searching a linked list, Insertion into a linked List, Deletion from a Linked List.

Stacks: operation on stack, Array Representation of Stack.

Queues: Linear Queue, Circular Queue, operation on Queue,.

UNIT IV

Trees : Definition of Trees: Types of Trees, Linear Tree, Binary Tree and Their Representation, Implementation and Searching (inorder, Preorder, Postorder)

Operations on binary search tree: Traversing, Searching, Insertion, Deletion.

UNIT V

Sorting: Sorting, bubble sort, quick sort, Insertion Sort, Selection Sort, Merge sort, heap sort.

Searching: Binary Search, hashing.

BOOKS RECOMMENDED :

1. *Data Structure - Seymour Lipschutz (Schaum's Series).*
2. *Data Structure & Program Design - Robert L. Kruse, 3rd Ed., Prentice Hall.*
3. Standish, Data Structure, Addison-Wesley.
4. A. M. Tennenbaum, Y. Langsam and M. J. Augenstein, Data Structures using C, PHI, 1996.
5. N. Wirth, Algorithms+Data Structures= Program, Prentice Hall.
6. [Robert Lafore](#), Data Structures and Algorithms in Java, Sams.
7. Sahni S, data Structures, Algorithms and Applications in C++ , Mc Graw- Hill, 2002.
8. R. B. Patel and M.M.S. Rauthan, [Expert Data Structures With C++](#), Khanna Publications, Delhi, India.
9. G. S. Baluja Data Structures Using C

Syllabus of B.Sc. (Computer Science) Semester - VI

PCSC -604 Management Information System

UNIT I

Management Information System: Definition, MIS as an evolving concept, MIS and other Academic Disciplines, Subsystems of an MIS.

Structure of MIS: Elements of an Information System, MIS support for Decision making, MIS Structure.

UNIT II

Hardware, Software, and communications Technology for Information Systems.

System & Design: Systems Development Initiative, Different Methodologies - Life Cycle & Prototype approach, detailed study on Life Cycle Design & Implementation. Case Study.

UNIT III

Managerial Decision Making: Decision Making Process, Group Decision Support Systems, Architecture of GDSS, Categories of GDSS.

UNIT IV

Decision Support System: Definition, Components of DSS (Data Base Management System, Model Base Management System, Support Tools), Applications of DSS, Functions of DSS.

UNIT V

Study of Computerization: Computerization in different functional areas of a typical manufacturing/business organization i.e. Marketing, production, material, financial, personal.

References:

- 1 Management Information Systems, Gordon B. Davis & Margerethe H. Olson Mc-Graw-Hill
- 2 Management Information Systems, Kenneth, Prentice Hall Publication
- 3 Management Information Systems, T. Lucey , Thomson Learning