Department of Computer Sc. & Information Technology (CSIT)  
Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G.  
Examination Scheme and Syllabus of B.Sc ( Computer Science)

### B.Sc-1\(^{st}\) Sem

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Paper Code</th>
<th>Subject</th>
<th>Marks Allotted</th>
<th>End Semester Marks</th>
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<tbody>
<tr>
<td>1</td>
<td>PCSC-101</td>
<td>Fundamentals of computer</td>
<td>50</td>
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<tr>
<td>2</td>
<td>PCSC-102</td>
<td>Introduction to Programming Methodology</td>
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<tbody>
<tr>
<td>1</td>
<td>PCSC-201</td>
<td>Introduction to Logics of Computer</td>
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<tr>
<td>2</td>
<td>PCSC-202</td>
<td>System Analysis &amp; Design</td>
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<td>LAB 2</td>
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<tr>
<td>1</td>
<td>PCSC-301</td>
<td>Introduction to Operating system</td>
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<td>2</td>
<td>PCSC-302</td>
<td>Introduction to C Language</td>
<td>50</td>
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<td>3</td>
<td>PCSC-303</td>
<td>LAB 3</td>
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<tr>
<td>1</td>
<td>PCSC-401</td>
<td>Database Management System.</td>
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<td>PCSC-402</td>
<td>Computer Based Numerical Method.</td>
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<tr>
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<td>PCSC-501</td>
<td>Internet Application</td>
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<td>Objected Oriented Concepts</td>
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<td>03</td>
<td>PCSC-503</td>
<td>System Software</td>
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<td>04</td>
<td>PCSC-504</td>
<td>Introduction to Artificial Neural Network</td>
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<td>PCSC-505</td>
<td>Minor Project</td>
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<td>PCSC-601</td>
<td>Programming with JAVA</td>
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<td>PCSC-602</td>
<td>Software Testing</td>
<td>50</td>
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<td>03</td>
<td>PCSC-603</td>
<td>Introduction to Data Structure</td>
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<td>PCSC-604</td>
<td>Management Information System</td>
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<td>PCSC-605</td>
<td>Major Project</td>
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<td><strong>Total</strong></td>
<td><strong>300</strong></td>
<td><strong>180</strong></td>
<td><strong>120</strong></td>
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</table>

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:
2. V. Rajaraman, Computer fundamental, PHI publication.


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-I

**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 from of Boolean expressions, minters, 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.
3. Digital Computer electronics: An Introduction to micro computers by Albert Malvino and Jerald Brown, Tata Mcgraw Hill.
Subject – System Analysis and Design
Paper code – PCSC-202


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?


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
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.


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:

3. Tanenbaum, Modern Operating Systems, PHI.
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:

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 Independence, Data Models, Data Dictionary.


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:
Syllabus of B.Sc (Computer Science) IV Semester

Subject – Computer Based Numerical Method

Paper code – PCSC-402


**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**:

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. Ciner, Prenllicc- Hall, India.
Overview of Object Oriented: Ned 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:

2. Object Oriented Programming & C++: By R. Raja Raman

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

Subject – System Software

Paper code — PCSC-503
**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:**


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**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