

BSC I SEMESTER

Subject : Computer Science

Paper : Computer Fundamentals & Programming Techniques – I (Using C)

Lectures/Unit	Theory		CCE		Practical	
	Max	Min	Max	Min	Max	Min
14	85	28	15	5	50	17

UNIT I

Computer- Block diagram Evolution, Classification, Generation, Uses, types, Hardware & Software
Input Devices: Keyboard, Joysticks, Mouse, Light Pen, OMR, OCR, MICR, Punched Cards, barcode reader. **Output Devices:** Monitors & its types Printers - Impact, Non-Impact, Plotters. System Motherboard. **Primary Memory:** RAM (Dynamic & Static), ROM (PROM, EPROM, EEPROM), Cache, Virtual. **Secondary Memory:** Magnetic- Tape & Disk , Optical disk. **Data representation of Computer:** Number System- Binary, Octal, Decimal & Hexadecimal & their inter-conversions. Arithmetic operation on binary number, Fixed Point and Floating Point representation of numbers, Complements, Alphanumeric Representation, Binary codes – BCD, EBCDIC, ASCII, Gray.

UNIT II

System Software (Operating System, Utilities & service Programs), **Application Software-** Languages & Packages, Introduction to OS-types & its functions, Wild Cards (*,?), **Booting a System** (ROM BIOS, Self Test, Post, IOSYS, MSBIOS, SYS, Autoexec.Bat, Config.Sys, Command.Com). **Internal & External Commands With Syntax (Arguments & Parameters)**
Programming Language: Types of PL {HL,ML,LL}, **Language translator** – Assembler, Compiler and Interpreter.

UNIT III

Classification of Programming Language: Procedural Languages, Problem Oriented Languages, Non-Procedural Languages. **Structured Programming Concepts:** Top-Down Analysis, Modular Programming, Structured Code. **Problem Solving using Computers:** Problem definition and analysis, Problem design, Coding, Compilation, Debugging and testing, Documentation, Implementation and Maintenance. **Introduction to C language:** Constants, Variables, Keywords, Data types, Operators, Expressions, Operator Precedence and Associativity.

UNIT IV

Structure of C Program: Variable declaration, declaration of variable as constant. **Managing Input/Output Operators:** Formatted and Unformatted. **Control Statements:** Branching, Jumping & Looping.Scope Rules, Storage Classes. **Arrays** (One and Two Dimensional).

UNIT V

Functions: User defined function, Standard function, Categories in Functions, Passing Arguments to a Function, Recursion. **Pointers:** Operators, Declaration, pointer to arithmetic, array of pointers. **Structures:** Declaring, Accessing, Initializing, Array of structures.

File Handling in C: Opening and Closing a Data File, Inserting data to data file.

Text Books:-

Computer Fundamentals- P.K. Sinha BPB Publications II Edition,
Computer System Architecture – M.Moris Mano Unit IV- Pg 67-69, Unit V – Pg 1-58

Let us C by Yashwant Kanetkar,IV Edition.

Ansi C by E. Balaguruswamy

Intoduction to C by Bhatia

Reference Books:-

O Level Module – V. K. Jain, Computer Today- Basandra, Computer Architecture and Organization – John P. Hayes McGraw Hill

Computer Fundamentals: - V. Raja Raman – Prentice Hall of India Private Ltd. Computer Organization and Architecture – William Stallings

O Level Module – V. K. Jain, Computer Today- Basandra,

Computer Fundamentals: - V. Raja Raman – Prentice Hall of India Private Ltd. Computer

Introduction to Algorithms by Cormen. PHI

Programming in C:Denis Richi

B.SC. – II Sem
Subject: Computer Science
Paper- Computer Architecture & Programming in C++

Lectures/Unit	Theory		CCE		Practical	
	Max	Min	Max	Min	Max	Min
14	85	28	15	5	50	17

Unit-I

Concepts of Boolean Algebra, Logic Gates, Logic Diagrams of Boolean Expressions, De Morgan's theorem, Minimization Techniques K-Map, SOP (Sum of Products) and POS (Products of Sum), Combinational Circuits, Adders, Sub tractors, Multiplexers, Decoders , Sequential Circuits, Flip-Flops (SR, D, JK, T), Registers (Shift Register), Counters (Binary, UP, Down, Ripple).

Unit-II

I/O Interface, Properties of simple I/O devices and their controller, Isolated versus memory-mapped I/O, Synchronous & Asynchronous Data transfer, Handshaking, Asynchronous serial transfer, Modes of Data transfer, I/O Processor .**Memory**: Auxiliary memory, Magnetic Drum, Disk & Tape, Semi-conductor memories, Memory Hierarchy, Associative Memory, Virtual Memory, Address space & Memory Space, Address Mapping, Page table, Page Replacement, Cache Memory, Hit Ratio, Mapping Techniques.

Unit III

Introduction to C++: Programming paradigms, Key concepts of Object-oriented Programming, Advantages of OOP's. **Input and Output in C++**: Pre-defined streams, Unformatted console I/O operations, formatted console I/O operations.**C++ Declarations**: Parts of C++ Program, types of Tokens, Keywords, Identifiers, data types, constants, Operators, Precedence of operators, referencing and dereferencing operators, scope access operator.**Control structures**: Decision Making Statements, looping statement.

Unit IV

Functions: main(), parts of function, passing arguments[value, address, reference], inline functions, function overloading[principles, precautions], library functions. **Classes and objects**: declaring [classes, objects], accessing class members, keyword[public, private, protected], defining member functions[member function inside the class, member function outside the class, static member variables and functions, friend function, friend classes, overloading member functions. **Constructors and Destructors**: characteristics, applications, constructors with arguments, overloading constructors, types of constructors.

Unit V

Operator overloading: overloading unary operator, binary operator. **Inheritance**: access specifiers and simple inheritance, public inheritance, private inheritance, protected data with private inheritance, Types of inheritances[single, multiple, hierarchical, multilevel, hybrid, multipath], virtual base class. **Pointers & arrays**: pointer declaration, pointer to class & object, this pointer. **Array**: declarations & initialization, arrays of classes. **Polymorphism**: Static(Early) binding, Dynamic (Late) Binding, virtual function, pure virtual function.

Text books:

Object-Oriented Programming with ANSI & Turbo C++ Ashok N. Kamthane.
 Balagurusamy: object oriented programming in C++

BARTEE, "Digital Computer Fundamentals " TMH Publication

Reference Books:

Herbert Schlitz: C++ the complete Reference- TMH publication. R.
 Lafore: Object oriented programming in C++

BSC III SEMESTER
Subject : Computer Science
Paper: Data Structure & Computer Oriented Numerical Analysis

Lectures/Unit	Theory		CCE		Practical	
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UNIT I

Concept of data structure, Abstract data structure, Introduction to stack and primitive operation on stack using array. **Stack applications:**-Infix, Prefix, Postfix and Recursion, Introduction to queues, Primitive operation on queues using array, Circular queue ,Dequeue , Priority queue and Applications of queue.

UNIT II

Linked List- Introduction to Linked List, Types of Linked List (Singly, Circular Linked List, Doubly Linked List) ,Basic operations on Linked List(Insertion, Deletion & Traverse), Stacks, Queues ,Circular Queue using Singly Linked List, Application of Linked List. **TREES**-Basic terminology ,Binary Trees, Tree representations as array and Linked List, Basic operation Binary tree, Traversal of Binary trees:- Inorder, Preorder, Postorder, Application of Binary tree, Threaded Binary tree.

UNIT III

Searching & Sorting: Sequential Searching, Binary search, Insertion sort, Selection sort, Quick sort, Bubble sort, Heap sort, Comparison of sorting methods.

UNIT IV

Representation of numbers and its types. Errors and their computation- absolute, relative and percentage error. **ITERATIVE METHODS TO FIND ROOTS OF NON-LINEAR EQUATIONS**-Newton Raphson method, Bisection Method, Regular falsi method(False Position Method), **MATRICES:** Hermitian, Skew Hermitian & Symmetric & Skew Symmetric Matrices, Determinant & Inverse of a Matrix. Rank & Nullity of matrices.

UNIT V

SYSTEM OF LINEAR ALGEBRAIC EQUATIONS: Cramer rule, LU-Decomposition of Matrix, Gauss Elimination Method, Jacobi Iteration Method, Gauss Siedal Iteration Method, Gauss Jordan Method. **INTERPOLATION AND APPROXIMATION:** Newton Forward and Newton Backward Interpolation Formula, Lagrange Interpolation Formula. **NUMERICAL INTEGRATION:** Trapezoidal Rule and Simpson's Rule- Simpson 1/3 and Simpson 3/8.

Text Books:-

Data Structures Through C (A Practical Approach) by G.S.Baluja

Data Structure: By Trembley & Sorrenson.

Numerical Methods By E Balagurusamy

Numerical Methods By Dr. B.S. Garewal

Data Structure: By Lipschuists (Schaum's Outline Series)

Reference Books:-

Fundamental of Computer Algorithm: By Ellis Horowitz and Sartaj Sahani

Numerical Methods and Analysis By S.S.Shastry

B.SC. – IV Sem
Subject- Computer Science
Paper – Database Management System (SQL Programming) & Java

Lectures/Unit	Theory		CCE		Practical	
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UNIT I

Introduction to database systems-Purpose of Database Systems, File Management Vs Data management, Architecture of Database System, Views of data , Data Model-E-R, Relational, Network, Hierarchical. **Set theory concepts and fundamentals:** Relations, Domains, Attributes, Tuple, Concepts of Keys: Candidate key, Primary Key, Alternate Key, Super Key, Foreign Key, Fundamental integrity

rules: Entity integrity, Referential integrity, Functional Dependencies, Decomposition, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF 5NF.

UNIT-II

Introduction to Oracle: Tools of Oracle Kernel, Oracle data types, two dimensional matrix (table), SQL commands: DDL, DCL, DML, Operators in Oracle, Renaming columns, range searching, pattern matching, oracle functions, sub queries, indexes, clauses[union, intersection minus], Joins Views, Granting & Revoking Permission, Oracle transactions,[rollback, commit, save point], PL/SQL Introduction: data types, character set, block structure of PL/SQL program. Cursors, Error handling in PL/SQL. Procedures & Functions in PL/SQL ,Database triggers: types of triggers, creating & deleting trigger

UNIT-III

C++ Vs JAVA, JAVA environment, Structure of Java, Tokens, Statements, JAVA virtual machine, Constant & Variables, Data Types, Scope of Variables, Symbolic Constants, Type Casting.

Java Operators, Expressions & its evaluation, Control Statements, Java operators. Defining a Class, Adding Variables and Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods.

UNIT-IV

Arrays: One Dimensional & two Dimensional, strings, Vectors, wrapper Classes, Defining Interface Extending Interface, Implementing Interface, Accessing Interface Variable, System Packages, Using System Package, Adding a Class to a Package, Hiding Classes.

Inheritance: Extending a Class, Overriding Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract methods and Classes, Visibility Control.

UNIT-V

Creating Threads, Extending the Threads Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the Runnable Interface. Local and Remote Applets Vs Applications, Writing Applets, Applets Life Cycle, Creating an Executable Applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet, Passing Parameters to Applets, Aligning the Display, HTML Tags & Applets, Getting Input from the User

Text books:

SQL, PL/SQL programming: Ivan Bay Ross, BPB publication.

E. Balaguruswamy, "Programming In Java", 2nd Edition, TMH Publications ISBN 0-07-463542-5

Reference Books:

Oracle & Developer 2000: Ivan Bay Ross, BPB publication.

Database System Concepts: Silerschatz & Korth : McGrawHill publication.

Peter Norton, "Peter Norton Guide To Java Programming", Techmedia Publications ISBN 81-87105-61-5

BSC V SEMESTER
Subject : Computer Science
Paper : Conceptual Operating Systems & Web Page Programming

Lectures/Unit	Theory		CCE		Practical	
	Max	Min	Max	Min	Max	Min
14	85	28	15	5	50	17

UNIT I

Introduction – functions & types of operating systems, Computer-System Structures, Operating-System Structures, **Process management** - Process Concept, Process Scheduling, Operation on Processes, Interprocess Communication. **CPU Scheduling**- Basic Concepts, Scheduling Criteria, **Scheduling Algorithms**- FCFS, SJFS, Priority Scheduling, Round-Robin Scheduling. **Process Synchronization**- Background, Critical-Section Problem, Petersons Solution, Classic Problems of Synchronization.

UNIT II

Deadlocks-System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery From Deadlock. **Memory Management** Swapping, Paging-Basic Method, Contiguous Memory Allocation. **Virtual Memory Management**- Background, Demand paging, Page Replacement Algorithms. **Storage Management**- File concept, Access methods, Directory structure. **Disk Scheduling**-FCFS, SSTF, SCAN, C-SCAN, LOOK.

UNIT III

Internet and Web Technologies: Introduction to Web Technologies- HTML, JavaScript, CSS, XML, XHTML, AJAX, ASP.NET, PHP. Introduction to HTML- HTML Tags, Elements and Attributes, Structure of HTML code. **HTML fundamentals:** Horizontal Rules, Line Breaks, Paragraph. **Working with Text:** Bold, Italic, Subscripted, Superscripted. **Organizing Text in HTML:** DIV, SPAN Elements. Working with Links, URLs, Images and Tables. **Working with Forms:** password, hidden, checkbox, radio, submit, reset, multiple choice elements- SELECT, OPTION, TEXTAREA, LABEL Elements. **Overview of JavaScript:** Features, **Uses:** HTML Document, HEAD and BODY Elements, External File. **Programming Fundamentals:** Variables, Operators, Control Flow Statements, Popup Boxes. **Functions:** Defining and Invoking, Arguments and Return Statements, Scope and Closures. **Events:** onclick, onload, Mouse, onreset, onsubmit. **Objects:** Array, Date. Document Object Model (DOM).

UNIT IV

Cascading Style Sheet (CSS): Introduction, Syntax, Selector. **Inserting CSS:** External, Internal and Inline. **CSS:** Text, Fonts, Links, Lists, Tables, Border, Margin, Padding, Align, Outline, Positioning and Floating. **PHP Essentials:** Internet, Local Machine, Development Environment, HTML and PHP. Variables, Constants, Operators. **Control Structures:** if, switch, for, while, do...while, foreach. Strings. **Array related built-in functions:**array_keys(), array_search(), array_values(), array_push(), array_pop(), array_slice(), array_merge(), sort(), asort(), ksort(). **Functions:** function call, passing arguments, pass by value, pass by reference, returning values to functions. Forms, GET and POST data, Date and Time, File Upload, Cookies, Session, Error Handling.

UNIT V

Introduction to My-SQL , creating Database in My-SQL, My-SQL and PHP: Database connectivity, Adding, modifying and deleting records, Access Records From Database. Creating and managing sessions in PHP

Text Books:

Operating System Concepts by Silberschatz & Galvin, Addison Wesley Publication 6th Edition
 HTML5 Black Book Kogent Learning Solutions Inc. Dreamtech PRESS
 The Complete Reference PHP by Steven Holzner McGraw Hill Education India Private Limited New Delhi
<http://www.nettech.in/e-books/Teach-Yourself-PHP4-in-24-Hours.pdf>(Ebook)

Reference Books:

Using Linux by Jack Tackett, David Gunter.
 Red Hat Linux 7.X Bible- Cristopher Negus.
 Linux Installation and Administration-Nicholas Wells, Course Technology(Vikas Publishing, New Delhi)

B.SC. – VI Sem
Subject- Computer Science
Paper – Computer Networks and Data Warehousing Techniques

Lectures/Unit	Theory		CCE		Practical	
	Max	Min	Max	Min	Max	Min
14	85	28	15	5	50	17

UNIT I

Needs and Advantages- Network, Types- Server based, Peer, Hybrid, Server types, Network Topology- Bus, Star, Ring, Star bus, Star ring, Mesh, Network Protocols- Hardware Protocols, Software Protocols, Selecting and designing. **Signal Transmission-** Digital signaling, analog signaling, bits synchronization, baseband and broadband transmission, **Network media types-** Properties and specialties, comparative studies, **Network adapters** - working principle, configuration and selection. OSI, TCP/IP model, Comparison between OSI and TCP/IP, **IEEE 802 standards-** 802.3(CSMA/CD Bus), 802.4(Token Bus),802.5 (Token Ring),**Ethernet** - working principle, 10&100 MBPS Ethernet, **Hubs, FDDI, Network Scaling-** No. Of computers, distance, software, speed and special requirements.

Unit-II

Networking Technologies- Fiber Channel, ATM, Network Connectivity- Hubs, Bridges, Repeaters, Multiplexers, Internet Connectivity- Routers and Brouters, Gateways, CSUs and DSUs. Various Server and Client hardware and softwares, Overview of Internet: Internet and TCP/IP, Internet addressing, Concepts of ISP, Concept of URL addresses, Hypertext Concepts and WWW, FTP, NNTP, Email, SMTP. Internet Security- Internet Security Issues, Embedded and Software based firewall, Data Encryption, Digital Signatures.

Unit-III

Data Warehouse: Introduction and Building Blocks- Objectives, **Features-**Types of Data, Data Granularity. Data Warehouses and Data Marts, Top-Down v/s Bottom-Up Approach. **Overview-** Architecture of Data Warehouse and its Components. Metadata and its Types.**Dimensional Modeling-** Requirements and Design Decisions. Dimensional Modeling Basics- Dimensions and Fact Table, E-R Modeling v/s Dimensional Modeling, Star Schema, Data Granularity, Star Schema keys and Its Advantages, Snowflake Schema- Its Advantages and Disadvantages, Aggregate Fact Tables- Need and Types.

Unit-IV

Data Extraction, Transformation and Loading(ETL)- Overview, Requirements and Steps of ETL , Data Extraction- Techniques & Types, Data Transformation- Types and Implementation, Data Loading- Techniques & Processes.**Online Analytical Processing (OLAP)-** Definitions, Rules, Characteristics, Functions, Features, Hypercubes, Drill- Down and Roll-Up Analysis, Models- Overview , ROLAP v/s MOLAP.

Unit-V

Latest Trends In Databases- Object Oriented Database, Web Database, Multimedia Database, Relational Database.

Text Book:

Computer Networks, 3rd edition, 1997, by A.S Tanenbaum. PHI. Local Area Networks – 5th Edition, S.K. Basandra and S. Jaiswal.

Data WareHousing Fundamental by PualrajPonniah(Wiley India Edition) Unit I,II, III, IV Data Warehousing,Data Mining &OLAP by Alex Berson Stephen J.Smith(Tata McGraw-Hill Edition)s Data Mining Concepts and Techniques, Han Kamber, Morgan Kaufmann Unit 1

Reference Book:

Data and Computer Communication, 1996, William Stallings, PHI
 Data Communication and Networking 2nd edition by Behrouz A. Forouzan, at McGraw- Hill
 Introduction to Business Intelligence and Data Warehousing, PHI
 The Data Warehouse Lifecycle toolkit, Ralph Kimball, John Wiley.