



Bachelor of Computer Applications

SEMESTER III

1. English-III
2. Computer Architecture & Microprocessor
3. OOPS With C++
4. Software Engineering
5. DBMS
6. OOPS With C++ Lab

3BCA3 - Computer Architecture and Microprocessor

UNIT-1

Basic Structures of Computers: Computer types; Functional Units – Input unit, Memory unit, Arithmetic and logic unit, Output unit, Control Unit; Basic operational concepts; Bus structures; Multiprocessor and Multicomputer.

Storage Representation: Storage representation of characters; Memory locations and addresses – Byte addressability; Memory operation.

Addressing modes: Direct, Indirect, Immediate, Relative, Indexed.

Instruction formats: Zero address, one address, One-and-half address, Two address, Three address.

Instruction types: Data transfer, Arithmetic, Branching, Logical, Rotate, Stack operations, Input/Output and Machine control instructions.

Input/output Organization: Accessing Input/output devices; Interrupts; Direct Memory Access (DMA)-Block diagram of DMA Controller, cycle stealing, Burst mode.

Buses – Synchronous bus, Asynchronous bus; Interface circuits – Parallel port, Serial port.

Unit – 2

Memory System: Basic concept; Random Access Memories – Static RAM, Asynchronous DRAMs, Synchronous DRAMs; Read Only Memories – PROM, EPROM, EEPROM, Flash memory; Cache Memory; Virtual memories; Secondary storage – Magnetic hard disks, Optical disks.

Introduction to Microprocessor, assembly language, 8085 Microprocessor architecture, Pin diagram, introduction to 8085 instruction set, assembly language programming.

Unit – 3

Programming technology of 8085 with additional instructions, counters and time delays, stacks and subroutine, interfacing peripherals (I/Os) and applications. Interrupts, keyboard interfacing.

Introduction to 8086, advantages over 8085, additional features of 8086, modified addressing schemes.

Reference Books:

1. Computer organization by Carl Hamacher, Z.Varnesic and S.Zaky 5th Edition ,Mc Graw Hill,2002.
2. Microprocesor Architecture Programming and Application with 8085 by Ramesh. S. Gaonkar – Penram International Publishing (India) .
3. M.Morris Mano –Digital Logic and Computer design,PHI Pvt.Ltd., New Delhi
4. Baary B Brey- The Intel Microprocessor Systems:The 8086/8088 family architecture, programming and designing-PHI Publication.
5. John Uffenbeck, Micro Computers and Microprocessor, PHI.

3BCA6: Database Management Systems

UNIT I

Introduction to Database System Concepts and Architecture

Databases and Database Users, Characteristics of the Database Approach, Actors on the Scene, Advantages of Using a DBMS

Data Models, Schemas and Instances, DBMS Architecture and Data Independence, Database Languages and Interfaces, The Database System Environment

Data Modeling Using the Entity-Relationship Model

Entity Types, Entity Sets, Attributes, and Keys, Relationship Types, Relationship Sets, Roles, and Structural Constraints, Weak Entity Types, ER Diagrams, Naming Conventions and Design Aspects

UNIT II

Transaction- Transaction Concepts, States, ACID properties, Concurrent executions, Serializability

Relational Data Model, Relational Constraints, and Relational Algebra

Relational Model Concepts, Relational Model Constraints and Relational Database Schemas, Basic Relational Algebra Operations, Additional Relational Operations, Examples of Queries in Relational Algebra.

Normalization- Functional Dependencies, Transitive and Multivalued dependency, First Normal form, Second Normal Form, Third Normal Form and Boyce Codd Normal Form

UNIT-III

Advantages of RDBMS- Codd's Rules.

SQL-The Relational Database Standard

Data Definition, SQL Data Types and Schemas, Constraints, Basic Queries in SQL, Insert, Delete, and Update Statements in SQL, Set Operations, Aggregate functions, Views (Virtual Tables) in SQL, Joins – Inner, Outer and Self, Additional Features of SQL, DCL-commit, Rollback, Save-point, Grant privileges.

Reference Books:

1. Fundamentals of Database Systems by Navathe and Elmasri –Pearson Education, Fifth Edition.
2. Database Systems Concepts, 3rd edition by Abraham Silberschatz, Henry Korth and S. Sudarshan McGraw Hill International Editions.
3. Introduction to Database systems by CJ Date, Published by Addison-Wesley.
4. Principles of database systems by Ullman, Computer Science press, 1984.
5. Introduction to database systems by Bipin C.Desai, Galgotia.

3BCA2: ENGLISH III

UNIT –I

Voice (5 Marks)

Direct and Indirect Speech (5 Marks)

Verbs: Linking Verbs; Auxiliaries

Transitive and Intransitive Verbs

Negative Verbs and Infinitives (10 Marks)

UNIT-II

Reading and Writing Skills:

Reading aloud passages from Books, Newspapers, Journals etc.,

Precise Writing (10 Marks)

Paraphrasing (5 Marks)

Expansion (5 Marks)

UNIT-III

Facing Interviews (Including preparation necessary)

Interviewing skills

Group Discussion (4 Marks)

Conversation Skills in specific situations: (8x2=16)

Fixing an appointment

- a) At a Bank; Post-office
- b) At an Airport, Bus Stand, Railway Station
- c) At a Travel Agency, At the Hospital
- d) At the Doctor's

3BCA8: Object Oriented Programming Lab

List of Experiments/Programs

PART-A

1. Write a c++ program to calculate the average of three numbers.
2. Write a c++ program to find the biggest of three numbers.
3. Write a c++ program to find minimum and maximum of two numbers using functions.
4. Write a c++ program to check the given number is palindrome or not
5. Write a c++ program to sum of all even and odd numbers.
6. Write a c++ program to perform arithmetic operations using classes and objects.
7. Write a c++ program to define a student class with user name, to name, total, average for n students.
8. Write a c++ program to illustrate the use of static member function.
9. Write a c++ program to find the mean value using friend function..
10. Write a c++ program to show the use of copy constructor.
11. Write a c++ program to implement multiple inheritances.
12. Write a c++ program to illustrate pointers to objects.
13. Write a c++ program to read a string with get line function.
14. Write a c++ program to display string with write() function.
15. Write a c++ program to specify field size with using width function.

PART-B

16. Write a c++ program to accept two times (hh:mm:ss) to find subtraction of two times.
17. Write a c++ program to implement processing shopping list using a class with arrays as data members.
18. Write a c++ program to implement banking scheme.
19. Write a c++ program to show the use of over loaded constructor.
20. Write a c++ program to construct variables at run time using dynamic initialization.
21. Write a c++ program to find the largest value among the set of parameters using overloaded function.
22. Write a c++ program to add two complex number using operator overloading.
23. Write a c++ program to demonstrate single inheritance.
24. Write a c++ program to implement multilevel inheritance.
25. Write a c++ program to illustrate the implementation of virtual base class.
26. Write a c++ program to illustrate the use of array of pointer to objects.
27. Write a c++ program to implement reading and writing class objects using files.

3BCA4: Object Oriented Programming with C++

Unit 1

1. Introduction

Procedure-oriented programming, Concepts of Object-oriented programming, benefits of OOP, Applications of OOP, Structure of C++ program.

2. Fundamentals

Tokens, Keywords, Identifiers and constants, Basic Data Types, User-defined data types, Derived data Types, Symbolic constants, Type compatibility, Declaration of variables, Dynamic initialization of variables, Reference variables, Operators in C++, Scope resolution operator, Member dereferencing operators, Memory management operators, Manipulators, Type cast operator, Expressions and their types, Special assignment expressions, Implicit conversions, Operator overloading, Operator precedence, Control structures.

3. Functions

The main function, Function prototyping, Call by Reference, Return by Reference, Inline functions, Default arguments, const arguments, Function overloading, Friend and Virtual functions.

Unit 2

4. Classes and Objects

Specifying a Class, Defining member functions, Making an Outside function Inline, Nesting of member functions, Private member functions, Arrays within a Class, Static data members, Static member functions, Arrays of Objects, Objects as function arguments, friendly functions, Returning Objects, const member functions, Pointers to members.

5. Constructors and Destructors

Constructors, Parameterized constructors, Multiple constructors in a class, Constructors with default arguments, Dynamic initialization of objects, Copy constructor, Dynamic constructor, Constructing Two-dimensional arrays, const Objects, Destructors.

6. Operator Overloading and Type Conversions

Defining operator overloading, Overloading unary operators, Overloading Binary operators, Rules for overloading operators, Type conversions.

Unit 3

7. Inheritance and Polymorphism

Introduction, defining derived classes, single inheritance, making a private member inheritable, multilevel inheritance, hierarchical inheritance, hybrid inheritance, virtual base classes, abstract classes, constructors in derived classes, polymorphism – introduction, pointers, pointers to objects, this pointers, pointers to derived classes, virtual functions, pure virtual functions.

8. Console I/O Operations

C++ streams, C++ stream classes, Unformatted I/O operations, Formatted I/O operations, managing output with manipulators.

9. Files: Classes for file stream operations, opening and closing a file, detecting end of file, more about open(): file modes, file pointers and their manipulations, sequential input and output operations.

10. Manipulating Strings

Introduction, creating objects, manipulating string objects, relational operations, string characteristics, accessing characteristics in strings, comparing and swapping.

Reference Books:

1. Object Oriented Programming with C++ , M.T. Somashekara, D.S. Guru, H.S. Nagendraswamy, K.S. Manjunatha, PHI Learning, New Delhi, 2012
2. Object Oriented Programming with C++ by E. Balagurusamy

3BCA5 - SOFTWARE ENGINEERING

UNIT - 1

1. Introduction to Software engineering , Software Products and characteristics, software engineering applications, Software engineering ethics.
Software Process - Software engineering models: Waterfall Model, Prototyping, Spiral Model, RAD Model.
2. **Requirement Engineering:** Functional and Non-functional requirements, User requirements, System requirements, the software requirements document; Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

UNIT – 2

3. **System Analysis Models:** Context models, Data models, Flow oriented Modeling – DFDs, Behavioral models – Use cases.
4. **Software Design:** Design process, Design characteristics, Design concepts,
Design Models - Architectural design - Software Approach, Data Design, Architectural Styles and Patterns, Architectural design.
Object Oriented Design - Object and Object Classes, design process, Design evaluation.
User Interface design - Interface Analysis, Interface Design Steps, and Design evaluation.

UNIT-3

5. **Verification and Validation:** Testing Strategies, Strategic issues, Test Strategies for conventional software - Black-box and White-box testing, Validation testing-System testing, Art of Debugging.
6. **Software Management:** Project management – Activities, Planning, Project Scheduling- Concepts and Principles,
Risk management – Software Risk, Risk identification, Risk projection, Risk refinement.
Software cost estimation– Estimation techniques - Decomposition Technique - software sizing,
Empirical estimation model -COCOMO Model, Project duration and staffing.
Quality management – Software quality Assurance and standards, ISO 9000 quality standards,
Software measurements, Metrics for Software quality.

Reference Books:

1. Software Engineering, Ian Sommerville, 6th Edition,9th Edition, Pearson Education Ltd.,
2. Software Engineering – A practitioners approach, Roger. S. Pressman, Tata-McGraw Hill 6th Edition.