**B.A.(Computer Science) Part-II (Semester III)**
**2025-26 & 2026-27 Sessions**

**BA314: C PROGRAMMING AND DATA STRUCTURES**

Total Marks: 70 | Maximum Time: 3 Hrs.
University Examination: 50 | Minimum Pass Marks: 35%
Internal Assessment: 20 | Lectures to be delivered: 45-55 Hrs.
Credit:3

**A) Instructions for paper-setter**

The question paper will consist of three sections. Section A, B and C. Section A and B will have four questions each from the respective sections of the syllabus out of which the student will be required to attempt two questions from each Section. Each question will carry 8 marks. Section C will be compulsory with 9 short-answer type questions of 02 marks each which will cover the entire Syllabus

## SECTION A

**Overview of C Language**: Fundamental Introduction to C, character set, identifiers, keywords, data types, constants, variable, user defined data types, arithmetic, unary, relational, logical, assignment and conditional operators & expression. Basic structure of a C program. Data I/O statement: single character I/O, formatted I/O, string I/O functions.

**Control Structure**: sequencing, alteration and nested loop.

**Functions:**Defining and accessing a function, passing arguments to a functions, specifying arguments data types, functions prototypes, recursion

**Storage Classes**: Automatic, External, Static, Register.

**Pointers and Structures:** Character pointers, pointer to array, array of pointers.

**Structure and Unions:** Defining and processing structure, Unions Preprocessor Directives.

## SECTION B

**Basic Notations and Array (Data Structure):** Basic concept and notations, data structures, Types of data structure and data structure operations, mathematical notation and functions, algorithmic complexity, Big 'O' notation and time space trade off.

**Arrays:** Linear array, Representation of Linear array in memory, Traversing Linear array, Insertion and deletion in an array, Multi-dimensional array: Row-Major, Column Major order, space array.

**Stacks:** Push and Pop in Stack. Representation of stack in memory (Using Arrays)

**Queues:** Insertion and deletion operations.

**Searching Techniques:** Linear and binary search

**Sorting Techniques**: Insertion sort, selection sort, bubble sort, merge sort, quick sort.

**Reference Books:**

1. Seymour Lipschutz, Theory & Practice of Data Structures, McGraw Hill, 1988.
2. B.W. Kerrighan and D.M.Ritchie, The C programming language, PHI
3. Vikram Gupta and S. S. Bhatia, Programming Fundamentals through C Language, Kalyani

**BA314P: C PROGRAMMING AND DATA STRUCTURES Lab**

External (Practical): 20 Internal (Practical): 10
Min. Pass Marks: 35% Credit:01
Practical units to be conducted: 45-55 Hrs

The laboratory course will comprise of exercise to supplement what is learnt under BA314 C Programming and Data Structures.

**Detailed Syllabus**

1. Programs to be implemented in C language such as
   (a) to find the sum of digits of a given number.
   (b) to find the sum of odd numbers and sum of even numbers from the numbers entered through the keyboard.
   (c) to check whether a given number is prime or not,
   (d) Conversion from one number system to another number system.
2. Programs related to array such as:
   (a) to find the maximum and minimum in a given array
   (b) for matrix multiplication, addition, subtraction, etc.
3. Programs related to function, structures, pointers
   (a) all the programs should be written with the help of user defined functions.
   (b) String processing with the help of pointers.
   (c) Simple programs using structures, such as printing the merit list of the students record.
4. Programs related to searching and storing.

# B.A.(Computer Science) Part-II (Semester IV)
# 2025-26 & 2026-27 Sessions

**BA414 :DATABASE MANAGEMENT SYSTEM**

Total Marks: 70
University Examination: 50
Internal Assessment: 20

Maximum Time: 3 Hrs.
Minimum Pass Marks: 35%
Lectures to be delivered: 45-55 Hrs.
Credit:3

**A) Instructions for paper-setter**

The question paper will consist of three sections. Section A, B and C. Section A and B will have four questions each from the respective sections of the syllabus out of which the student will be required to attempt two questions from each Section. Each question will carry 8 marks. Section C will be compulsory with 9 short-answer type questions of 02 marks each which will cover the entire Syllabus

SECTION A

**Traditional file procession system:** Characteristics, limitation. Database: Definition, composition

**Database Management System:** Definition, Characteristic advantages over traditional file processing system, Implication Database approach, Uses of database, DBA and its responsibilities Database schema, instance. DBMS architecture, data independence, mapping between different levels.

**Database language :** DDL, DML, DCL. Database utilities, Data Models, Keys: Super, candidate, primary, unique, foreign.

**Entity relationship model:** concepts, mapping cardinalities, entity relationship diagram, weak sets, strong entity sets, aggregation, generalization, converting ER diagram to tables.

**Relational Algebra:** Basic operations, additional operations.

SECTION B

**Database design:** Functional dependency, decomposition, problem arising out of bad database design, normalization, multi-valued dependency. Database design process, database protection, database integrity, Database concurrency: Problems arising out of concurrency, methods of handling concurrency. Data recovery, database security: Authentication, authorization, methods of implementing security.

**Open source Access:** Introduction to open source Access tools such as LibreOffice, SQLite etc., working with database and tables, queries in Access, Applying integrity constraints, Introduction to forms, sorting and filtering controls, Reports and Macro: Creating reports using Macros.

**Text Book:**

1. C.J. Date, An Introduction to Database Systems, Narosa Publishers.

**Reference Books**:

1. Siberscharts, Korth and Sudarshan, "Database Concepts", Mcgraw Hill Publication.
2. Ivan Bayross, "Oracle 7 The complete reference", BPB Publications.
3. Jeffrey D. Ulliman, "Principles of Database Systems", 2nd Ed., Galgotia Publications.
4. D. Kroenke, "Database Processing", Galgotia Publications.

**BA414P: DATABASE MANAGEMENT SYSTEM Lab**

External (Practical): 20 | Internal (Practical): 10

Min. Pass Marks: 35% | Credit:01

Practical units to be conducted: 45-55 Hrs

The laboratory course will comprise of exercise to supplement what is learn under Paper BA414T: DATABASE MANAGEMENT SYSTEM.

- Open Source ACCESS: Introduction to open source Access tools such as Libre Office, SQLite etc., working with databases and tables, queries in Access Applying integrity constraints.
- Introduction to forms, sorting and filtering, controls.
- Reports and Macro: creating reports, using Macros.