

## ***B.A /B.Sc. (Life Sciences) with Computer Application Syllabus***

### **II Semester, DSC 1B**

#### **Computer Programming with C**

##### **Unit - I**

Computing Concepts: Types of Software, Programming Languages, Translator Programs, Problem Solving Techniques, Using Computer.

Overview of C: History of C, Importance of C, Sample Programs, Basic Structure of C Programs, Programming Style, Executing a ' C ' Program.

Constants, Variables, and Data Types : Introduction, Character set, C tokens, Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables, Declaration of Storage Class, Assigning Values to Variables, Defining Symbolic Constant, Declaring Variable as Constant and Volatile, Overflow and Underflow of Data.

Managing Input and Output Operations: Introduction, Reading a Character, Writing a Character, Formatted Input and Output.

Operators and Expressions : Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operator, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of expressions, Precedence of Arithmetic Operators, Some Computational Problems, Type Conversions in Expressions, Operator Precedence and Associativity, Mathematical Functions.

##### **Unit – II**

Decision Making and Branching: Introduction, Decision Making with IF Statement, Simple If Statement, The If...Else Statement, Nested of If...Else Statements, The else if Ladder, The Switch Statement, The?: Operator, The Goto Statement.

Decision Making and Looping: Introduction, The While statement, the do Statement, the For Statement, Jumps in Loops.

Arrays: Introduction, One-dimensional Arrays, Declaration and Initialization of One-dimensional Arrays, Two-dimensional Arrays, Initializing two-dimensional Arrays, Multi-dimensional Arrays, Dynamic Arrays.

##### **Unit III**

Character Arrays and Strings: Introduction, Declaring and Initializing String Variables, Reading Strings from Terminal, Writing Strings to Screen, Arithmetic Operations on Characters, Putting Strings together, Comparison of Two Strings, String-handling Functions, Table of Strings, Other Features of Strings.

User-Defined Functions : Introduction, Need for User-Defined Functions, A Multi-function Program, Elements of user-defined Functions, Definition of Functions, Return Valus and their Types, Function Calls, Function Declaration, Category of Functions, No Arguments and No Return Values, Arguments but No Return Values, Arguments with Return Values, No Arguments but Returns a Value, Functions that Return Multiple Values, Nesting of Functions, Recursion, Passing Arrays to Functions, Passing Strings to Functions, The Scope, Visibility and Lifetime of Variables, Multifile Programs.

## ***B.A /B.Sc. (Life Sciences) with Computer Application Syllabus***

### **Unit- IV**

Pointers : Introduction, Understanding Pointers, Accessing the Address of a Variable, Declaring Pointer Variables, Initialization of pointer Variables, Accessing a Variable through its pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays, Pointer and Arrays, Pointers and Character Strings, Arrays of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers and Structures.

Structures and Unions : Introduction, Defining a Structure, Declaring Structure Variables, Accessing Structure Members, Structure Initialization, Copying and Comparing Structure Variables, Operations on Individual Members, Arrays of Structures, Arrays within Structures, Structures within Structures, Structures and Functions, Unions, Size of Structures, Bit Fields.

File Management in C : Introduction, Defining and Opening a File, Closing a File, Input/Output Operations on Files, Error Handling During I/O Operations, Random Access to Files, Command Line Arguments.

#### Text Book:

1. Computing Fundamentals & C Programming – McGrawHill Education.

#### References:

1. Spoken Tutorial on “C”, as E-resource for Learning. <http://spoken-tutorial.org>

## ***B.A /B.Sc. (Life Sciences) with Computer Application Syllabus***

### **Practical: Computer Programming with C**

#### NOTE:

- All the concepts of programs from Text Book including exercises must be practice, execute and write down in the practical record book.
- Faculty must take care about UG standard programs it should be minimum 25 – 30.
- In the external lab examination student has to execute at least three programs with compilation and deployment steps are necessary.
- External Viva-voce is compulsory.

#### Example programs:

1. Write a c program for electricity bill tacking different categories of users, diffrent slabs in each category.(using nested if else statement)
2. write a c program to evaluate the following using loops
  - a.  $1+x^2/2!+x^4/4!+\dots$ upto 5 terms
  - b.  $x+x^3/3!+x^5/5!+\dots$ upto 5 terms
3. Write a c program to check whether the given number is
  - a. Prime or not
  - b. Perfect or abundant or deficient
4. Write a c program to find the mean, mode, median, and variance of list of values by using one dimensional array
5. Write a menu driven program to read a list of numbers and perform the following operations
  - a. Print the list
  - b. Delete duplicates from the list
  - c. Reverse the list
6. Write a program to read a list of numbers and search for given number using binary search algorithm and if found display its index otherwise display the message "element not found in the list" using functions
7. Write a menu driven program to read two matrices and compute their sum and product using functions
8. Write a menu driven program to read list of student names and perform the following operations using functions.
  - a. To print list of names
  - b. To sort them in ascending order
  - c. To print the list after sorting
9. Write a c program that consists of recursive functions to find
  - a. Factorial of a given number
  - b. Print the pascal triangle using bionomial theorem

***B.A /B.Sc. (Life Sciences) with Computer Application Syllabus***

10. Write a menu driven program to read list of student names and perform the following operations using array of character pointers.
  - a. To insert a student name
  - b. To delete a name
  - c. To print the names