

B.A (Prog) with Computer Science as Major

CATEGORY-II

DISCIPLINE SPECIFIC CORE COURSE – 1: INTRODUCTION TO PROGRAMMING USING C++

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Introduction to Programming using C++	4	3	0	1	Class XII pass	Nil

Learning Objectives

This course is designed to:

- Introduce programming concepts using C++ to students.
- Develop structured as well as object-oriented programming skills using C++ programming language.
- Achieve competence amongst its students to develop correct and efficient C++ programs to solve problems spanning multiple disciplines.

Learning outcomes

On successful completion of the course, students will be able to:

- Write simple programs using built-in data types of C++.
- Implement arrays and user defined functions in C++.
- Solve problems spanning multiple disciplines using suitable programming constructs in C++.
- Solve problems spanning multiple disciplines using the concepts of object oriented programming in C++.

SYLLABUS OF DSC - 1

Theory

Unit – 1

(3 hours)

Introduction to C++

Need and characteristics of Object-Oriented Programming, Structure of a C++ Program (main () function, header files, output, input, comments), compile and execute a simple program

Unit – 2 (9 hours)

Data types and Expressions

Keywords, built in data types, variables and constants, naming convention, Input-Output statements, operators and their precedence, expressions, typecasting, library functions

Unit – 3 (12 hours)

Control Constructs in C++

Decision making using selection constructs, iteration using looping constructs.

Unit – 4 (6 hours)

Arrays, Pointers and User Defined Functions

Defining and initializing single and multi-dimensional arrays, user defined functions, passing arguments to functions, returning values from functions, inline functions, default arguments, introduction to pointers

Unit – 5 (15 hours)

Classes and Objects

Need and implementation of abstraction, encapsulation, inheritance and polymorphism, creating classes, objects as function arguments, modifiers and access control, constructors and destructors.

Practical (30 hours)

List of Practicals:

1. Write a program to find the largest of n natural numbers.
2. Write a program to find whether a given number is prime or not.
3. Write a program that takes a positive integer n and the produce n lines of output as shown:
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* *

* * *

* * * *
(for n = 4)
4. Write a menu driven program for following:
 - a. to check whether a given number is odd or even.
 - b. display a fibonacci series
 - c. compute factorial of a number
5. Write a program to accept a number, reverse it and print the sum of its digits.
6. Write a program using functions to print the series and its sum:
 $1 + 1/2! + 1/3! + \dots + 1/n!$
7. Write a program to perform the following operations on an input string
 - a. Print length of the string

- b. Find frequency of a character in the string
 - c. Print whether characters are in uppercase or lowercase
 - d. to check whether a given string is palindrome or not.
8. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.
9. Design a class named Vehicle, having registration number and year as its private members. Define a suitable constructor and a method to print the details of a vehicle. Write a C++ program to test the above class.
10. Inherit a class Car from the Vehicle class defined above. Add model to the Car class. Define a suitable constructor and a method to print the details of a car. Write a C++ program to test inheritance of this class.

Essential Readings

- E. Balaguruswamy, Object Oriented Programming with C++, 7th edition, McGraw-Hill Education, 2017.
- 2. Robert Lafore, Object Oriented Programming in C++, 4th edition, SAMS Publishing, 2008.

Suggestive Reading

- D.S. Malik, C++ Programming: From Problem Analysis to Program Design, 6th edition, Cengage Learning, 2013.
- (ii) Herbert Schildt, C++: The Complete Reference, 4th Edition, McGraw Hill, 2003.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

DISCIPLINE SPECIFIC CORE COURSE – 2: PROGRAMMING FUNDAMENTALS USING PYTHON

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Programming Fundamentals Using Python	4	3	0	1	Class XII pass	Nil

Learning Objectives

This course is designed to:

- Introduce programming concepts using Python to students.