VIKRAM UNIVERSITY, UJJAIN

INSTITUTE OF COMPUTER SCIENCE

PROGRAMME TITLE: Certificate Course in C and C++ Programming Language

DURATION OF COURSE: 6 Months

SCOPE: This certification course will be run only at the Institute of Computer science. The main objective of this course is to make students self dependent (आत्मनिर्भर) in computer programming and computer technology, so that students can make their career in computer technology field.

PROGRAMME OBJECTIVES:

The objective of the Certification in Python Programming Language programme is to prepare students for productive careers in the software industry and computer programming job. Certification courses are aimed at skills development in computers using Programming Language skills.

The main objectives of the Certificate in C and C++ Programming Language programme include:

- Learn Fundamental of Programming Language and basics of computer technology.
- To develop in depth understanding of the key concepts of Programming Language to impart knowledge of problem solving techniques.
- Focus on development of knowledge and specific skills required in Programming Language C, C++.
- To develop competent computer professionals with strong ethical values.

PROGRAMME OUTCOMES (POs)

At the end of this Certificate in C and C++ Programming Language programme, student will be able to:

- Prepare software's and Application program on computer system.
- Gain understanding of the key programming language skills.
- Understanding the key concepts of Programming Language to improvise organizational performance.

After Completion of the programme students are able to work as-

- Software Developer.
- Language Programmer.

COURSE NAME: C and C++ Programming Language
LEVEL OF COURSE: CERTIFICATE COURSE
DURATION: 6 Months
ELIGIBILITY: 10+2
FEE: 3000/-

SCHEME OF EXAMINATION

Paper code	Title of Paper	Theory External Marks	Min.Pass Marks	Internal Mark	Min.Pass Marks	Total
	Paper-I	75	27	25	9	100
	Paper-II	75	27	25	9	100
	Internship/ Industrial Training/ Project Work	150 ------- 300 ---------	54 ------- -------	50 ------- 100 -------	28 ------- -------	200 ------- 400 -------

Code	Topic
Paper- I	Programming in C
Paper-II	Object Oriented Programming with C++

Programming in C

UNIT-1

Problem identification, analysis, design, coding, testing & debugging, implementation, modification & maintenance, algorithms & flowcharts, Characteristics of a good program – accuracy, simplicity, robustness, portability, minimum resource & time requirement, modularization; Rules/conventions of coding, documentation, naming variables; Top down design; Bottom-up design.

UNIT-2

History of C, Structure of a C program, Data types, Constant & Variable, Operators & expressions, Control Constructs – if-else, for, while, do-while, Case statement, Arrays, Formatted & unformatted I/O, Type modifiers & Storage classes, Ternary operator, Type conversion & type casting, Priority & associativity of operators.

UNIT-3

Functions, Arguments,return value, Parameter passing – call by value, call by reference, return statement, Scope, visibility and life time rules for various types of variable, static variable,

calling a function, Recursion – basics, comparison with iteration, tail recursion, when to avoid recursion examples.

UNIT-4

Special constructs – break, continue, exit(), goto& labels; Pointers - &and * operators, pointer expression, pointer arithmetic, dynamic memory management functions like malloc(), calloc(), free(), String, Pointer to function, Function to parameter, Structure – basic, declaration, membership operator, pointer to structure, referential operator, self-referential structures, structure within structure, array in structure, array of structures, Union – basic, declaration; Enumerated data type, Typedef, Command line arguments.

UNIT-5

File handling and related functions: printf&scanf family, C preprocessor – basics, # Include, # define, # undef, conditional compilation directive like #if, #else, #endif, #ifdef and #ifndef, Variable argument list functions.

Reference Books:

1. Kerninghan& Richie: The C Programming language, PHI
2. Cooper Mullish: The Spirit of C, Jaico Publishing House, Delhi
3. Kanetkar Y: Let us C
4. Kanetkar Y: Pointers in C.

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Object Oriented Programming Using C++

UNIT-1

Object Oriented Systems Development : Introduction to traditional programming with C. Objectives of OOP, Object Oriented Analysis, Object Oriented Programming in C++: Concepts of Objects, Classes, Data Abstraction, Encapsulation, Inheritance, Polymorphism, Dynamic Binding and Message passing.Tokens, Expressions and Control Structures.

UNIT-2

Classes &Objects: Classes, Structure & classes, Union & Classes, Friend function, Friend classes, Inline function, Scope resolution operator, Static class members: Static data member, Static member function, passing objects to function, Returning objects, Array of objects.

UNIT-3

Constructor &Destructor: Introduction, Constructor, Parameterized constructor, Multiple constructor in a class, Constructor with default argument, Copy constructor, Default Argument, Destructor.

Function & operator overloading: Overloading and information hiding, Function overloading, Operator overloading

UNIT-4

Inheritance: Inheritance, Derived and base classes, Single, Multilevel, Hierarchical, Hybrid Inheritance, Protected member, overriding member function, class hierarchies, multiple inheritance, Containership,Virtual base class

UNIT-5

Polymorphism : virtual functions, late binding, pure virtual functions, abstract classes, this pointer, templates, function templates, Class templates.

The C++ I/O system basics: C++ streams, The basic stream classes: C++ predefined streams.

Reference Books:

1. Object-Oriented Programming with C++: E. Balagurusamy, TMH, 2005
2. Object Oriented Programming in C++, Robert Lafore, Galgotia Publication.
3. Object Oriented Programming, Tomothy Budd, Pearson education.

Internship/ Industrial Training/Project Work