INVERTIS UNIVERSITY BAREILLY

Established by Govt. of U.P. u/s 2F of UGC Act, 1956 vide U.P. Act 22 of 2010.

BCS-501	FORMAL LANGUAGE AND AUTOMATA THEORY	L T P 3 0 0	3 Credits

Course Objectives:

CO1 To learn fundamentals of C Programming, Operators and Control Statements in C.

CO2 To understand usage of loop statements, arrays and strings in C Programming.

CO3 To learn the fundamentals of pointers, usage of pointers, memory allocation and functions in C Programming.

CO4 To understand the visibility and scope of variables on the basis of storage classes and defining user defined data types using structure, unions and enums in C Programming.

CO5 To learn how to handle a file using C Programs and fundamentals of an Operating System (Linux) Programming.

Detailed Syllabus

MODULE-I

Overview of C Programming : History of C and standardization of C, Importance of C, Basic Structure of a C Program.
Constants, Variables & Data Types : Keywords & Identifiers, Data types in C, Constants, Variable names.
Operators & Expressions : Arithmetic operators, Relational Operators, Logical operators, Increment and decrement operators, Bitwise Operators, Assignment operators, Conditional Operators, Special Operators, Ternary(?:) Operator, Operator Precedence, Operator Associativity.
Control Statements : Decision making with 'if statement', if…else statement, Nested if …else statement, Else …if ladder, switch statement.

MODULE-II

Loop Statements : do-while statement, while, for loop and usage of break/continue statements inside loop.
Arrays : Declaration of an array, initialization of arrays, types of arrays(one dimensional and multidimensional arrays), compile time arrays and runtime arrays, limitations of an array, operations on arrays(insertion, deletion, traversing and searching in an array).
Strings : Declaration of strings, initialization of strings, operations performed on string, string handling functions.

MODULE-III

Pointers : Understanding the basics of pointers, pointer declaration, accessing a variable

through its pointer, pointer arithmetic, pointer to array, pointer to strings, pointer to pointer i.e. double pointers.
Memory allocation in C : static and dynamic memory allocation(introduction to malloc, calloc, realloc and free functions).
Functions : Why functions, types of functions, a multi functional program, return values & their types, call by value and call by reference, arguments & return types, nesting of functions, recursion, returning multiple values from a function, pointer to functions.

MODULE-IV

Storage classes : auto, register, static, extern.
Structures and Unions : defining a structure, why is a structure needed, structure initialization, arrays with structures, arrays of structures, structures within structures, passing structures to functions, unions & its properties, access union member, pointer to structure and union, structure bitfield and functions inside structure.
Enums : declaration of enums, using enum as a type.

MODULE-V

File Management : what is a file, file structure, defining & opening a file, input/output operations on files.
Fundamentals of an Operating System : Introduction to OS, basic linux commands, different functionalities provided by an OS(process management, memory management, network communication).

Text Book:
Let us C - Yashavant Kanetkar: 19th Edition

Reference Books:

1. The C Programming Language - Brian Kernighan
   Dennis Ritchie:C17
2. C in Depth - S.K Srivastava/Deepali Srivastava
3. Mastering in C - KR Venugopal, Sudeep R Prasad

CO1 Students will be able to write programs using conditional statements and operators.

CO2 Students will be able to understand usage of loop statements, arrays and strings in C Programming.

CO3 Students will be able to learn the fundamentals of pointers, usage of pointers, memory allocation and functions in C Programming.

CO4 Students will be able to understand the storage classes and defining user defined data types using structure, unions and enums in C Programming.

CO5 Students will be able to learn how to handle a file using C Programs and fundamentals of an Operating System (Linux) Programming.