SHAMBHUNATH INSTITUTE OF ENGINEERING & TECHNOLOGY

Subject: Programming for Problem Solving (KCS-101)   **Required Periods:** 62

Module/Unit	No. Of lecture	Topics to be Covered
Unit-1	1	Introduction to the components of a Computer System;
	1	Memory and I/O Devices
	1	Storage, operating system
	1	Compiler, Interpreter, Loader and Linker
	2	Representation of Algorithm; Flowchart and Pseudocodes
	2	Structure of C program; Basic syntax and examples
	1	Compilation & execution of program and errors
	1	Components of C language, Standard I/O
	1	Fundamental data types, variables and memory locations
	1	Storage classes, automatic, register, static and external
Unit-2	1	Arithmetic expressions and Conditional Branching
	1	Operators and their types
	2	Expressions using numeric, relation, logical and assignment operators
	1	Mixed operands and type conversion
	1	Bit operators
	1	Operator precedence and associativity
	2	Conditional branching using if, if-else and nested if-else constructs
	2	Use of break statements and switch-case construct in C
Unit-3	2	Introduction of Iteration and Loops; While and do-while loops
	2	For loops with examples
	1	Use of break and continue statements in loop
	1	Introduction to functions; types and uses
	1	Declaring, defining and calling functions in C
	1	Parameter passing in functions; Call by value and call by reference
	2	Recursive functions and examples
Unit-4	1	**Arrays:** Array notation and representation
	2	Manipulating array elements
	1	Using multidimensional arrays
	2	Character arrays and strings
	2	**Structures and Unions:** Defining structures and using structures
	1	Array of structures
	1	Unions, Enumerated data types
	1	Passing array to functions
	4	Basic Searching and Sorting algorithms
	1	Finding roots of equations
	1	Notion of order of complexity
Unit-5	3	**Pointers**: Introduction, usage and declaration of pointers
	1	Dynamic memory allocation (malloc, calloc, realloc and free)
	1	Use of self-referential pointers and notion of linked list
	2	File Handling using C: File I/O functions with example
	1	standard C preprocessors
	1	defining and calling macros
	2	Conditional compilation, passing values to the compiler.
	1	Command line arguments
TOTAL LECTURES	62	