BVM ENGINEERING COLLEGE [AN AUTONOMOUS INSTITUTION]

ES105: PROGRAMMING FOR PROBLEM SOLVING
CREDITS - 4 (LTP:3,0,1)

Course Objectives:
To enhance logical thinking and to impart basic programming skills using C programming language

Teaching and Assessment Scheme:

Teaching Scheme (Hours per week)			Credits	Assessment Scheme				Total Marks
				Theory		Practical		
L	T	P	C	ESE	CE	ESE	CE	
3	0	2	4	60	40	20	30	150

Course Contents:

Unit No.	Topics	Teaching Hours
1	**Introduction:** Introduction to components of a computer system (disks, memory, processor, Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.), notion of machine level, assembly level and high level languages, Idea of algorithm: steps to solve logical and numerical problems, representation of algorithm: flowchart / pseudo code with examples.	6
2	**Fundamentals:** Features of 'C' language, structure of a 'C' program, basic data types, constants and variables, operators and their hierarchy, arithmetic expressions and precedence, writing simple programs in 'C', concept of header files	7
3	**Control Structure Of 'C':** Conditional branching using *if – else* statement, variations in usage of *if – else* statement, *switch-case*, and *goto* statements; looping using *for*, *while*, *and do – while,* use of *break* and *continue* statements	6
4	**Arrays and Strings:** 1D and 2D arrays, character arrays and strings, library functions for manipulation of strings	7
5	**Functions and Recursion**: Library and user-defined function, passing parameters to functions, passing array to functions, recursion as different way of solving problems, overview of macros and pre-processors	6

Unit No.	Topics	Teaching Hours
6	**Pointers and Structures:** Idea of pointers, defining pointers, simple programs using pointers in 'C', pointers and arrays, calling function by value and by reference, dynamic memory allocation: *malloc* and *calloc*, structures, defining structures, array of structures, nested structures, structure as an argument to functions, structures and pointers, unions	7
7	**File Handling in C:** Introduction, opening, closing, and input / output operations on files, error handling during I/O operations, random access of files	3
	Total	**42**

List of References:

1. Balagarusamy E, "*Programming in ANCI C",* Sixth edition; Tata McGraw-Hill Publishing Company Limited, 2012
2. Gottfried B S, "*Programming with C*", Second edition; Tata McGraw-Hill Publishing Company Limited, 2006
3. Kernighan B W and Ritchie D M, "*C Programming language*" Second edition; Prentice Hall, 2006
4. Kanetkar Y. P., "*Let us C*" Fifth edition; BPB Publication, 2004

Course Outcomes (COs):

After successful completion of this course, students will be able to:

1. Explain different features (keywords, constructs, functions, pointers, etc...) of C programming language
2. Decompose a problem into functions and synthesize a complete program using divide and conquer approach
3. To formulate simple algorithms for arithmetic and logical problems and translate them to programs
4. Use different features of C programming language to develop a possible programming solution to a given problem in a given domain
5. Decipher simple C programs and determine the outputs
6. Test and execute the programs and correct syntax and logical errors