Year	I	**Course Code:**21BCA1C1L	**Credits**	03
Sem.	I	**Course Title:** Programming in C	**Hours**	40
Course Pre-requisites, if any		NA		
Formative Assessment Marks: 40		Summative Assessment Marks: 60	Duration of ESA: 02 hrs.	
Course Outcomes		At the end of the course the student should be able to: 1. Read, understand and trace the execution of programs written in C language 2. Apply programming control structures for a given problem to create C code 3. Understand derived datatypes and develop C code using arrays/ strings 4. Understand user defined functions and datatypes to develop C code		

Unit No.	Course Content	Hours
Unit I	**Introduction to C Programming:** Overview of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C.**C Programming Basic Concepts:** C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants.**Input and output with C:** Formatted I/O functions - printf and scanf, control stings and escape sequences, output specifications with printf functions; Unformatted I/O functions to read and display single character and a string - getchar, putchar, gets and puts functions.	10
Unit II	**C Operators & Expressions:** Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associatively; Evaluation of arithmetic expressions; Type conversion.**Control Structures:** Decision making Statements - Simple if, if_else, nested if_else, else_if ladder, Switch Case, goto, break & continue statements; Looping. Statements - Entry controlled and exit controlled statements, while, do-while, for loops, Nested loops.	10

Unit III	**Derived data types in C:** Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.**Strings:** Declaring & Initializing string variables; String handling functions - strlen, strcmp, strcpy and strcat; Character handling functions - toascii, toupper, tolower, isalpha, isnumeric etc.	08
Unit IV	**User Defined Functions:** Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.**User defined data types:** Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.	12
Recommended Learning Resources		
Print Resources	1. C: The Complete Reference, By Herbert Schildt. 2. C Programming Language, By Brain W. Kernighan 3. Kernighan & Ritchie: The C Programming Language (PHI) 4. P. K. Sinha&PritiSinha: Computer Fundamentals (BPB) 5. E. Balaguruswamy: Programming in ANSI C(TMH) 6. Kamthane: Programming with ANSI and TURBO C (Pearson Education) 7. V. Rajaraman: Programming in C (PHI –EEE) 8. S. Byron Gottfried: Programming with C(TMH) 9. YashwantKanitkar: Let us C 10. P.B. Kottur: Programming in C (Sapna Book House)	

<table>
<tr><td>Year</td><td>I</td><td>Course Code: 21BCA1C1P</td><td>Credits</td><td>02</td></tr>
<tr><td>Sem.</td><td>I</td><td>Course Title: Lab: C Programming</td><td>Hours</td><td>40</td></tr>
<tr><td colspan="2">Course Pre-requisites, if any:</td><td colspan="3">NA</td></tr>
<tr><td colspan="2">Formative Assessment Marks: 25</td><td>Summative Assessment Marks: 25</td><td colspan="2">Duration of ESA: 02 hrs.</td></tr>
<tr><td colspan="2"></td><td colspan="3"><u>Part A:</u>
1. Program to read radius of a circle and to find area and circumference
2. Program to read three numbers and find the biggest of three
3. Program to demonstrate library functions in math.h
4. Program to generate the factorial of a given number
5. Program to generate n fibonacii sequence
6. Program to read a number, find the sum of the digits, reverse the number and check it for palindrome
7. Program to read numbers from keyboard continuously till the user presses 999 and to find the sum of only positive numbers
8. Program to read percentage of marks and to display appropriate message (demonstration of switch Case statement)
9. Program to find the roots of quadratic equation (Demonstration of else-if ladder)
10. Program to read marks scored by a students and find the average of marks
11. Program to remove Duplicate Element in a single dimensional Array</td></tr>
<tr><td colspan="2"></td><td colspan="3"><u>Part B</u>:
1. Program to Swap Two Numbers
2. Program to read a string and to find the number of alphabets, digits, vowels, consonants, spaces and special characters.
3. Program to Reverse a string without using built in function
4. Program to find the length of a string without using built in function
5. Program to demonstrate string functions.
6. Program to read, display and to find the trace of a square matrix</td></tr>
</table>

	7. Program to perform addition and subtraction of Matrices 8. Program to read, display and multiply two m x n matrices using functions 9. Program to check a number for prime by defining isprime( ) function 10. Program to demonstrate student structure to read & display records of n students. 11. Program to demonstrate the difference between structure & union.

Note: Student has to execute a minimum of 10 programs in each part to complete the Lab course

Evaluation Scheme for Lab Examination

Assessment Criteria		Marks
Program – 1 from Part A	Writing the Program	03
	Execution and Formatting	07
Program -2 from Part B	Writing the Program	03
	Execution and Formatting	07
Viva Voice		05
Total		**25**