Course Code	Course Title	L	T	P	C	
BESBS1040	**Programming for Problem Solving**	**2**	**0**	**0**	**2**	

Pre -Requisite: computer basics.

Course Educational Objective

CEO1:To formulate algorithm, translate into program and then execute the programs for verifying its correctness.

CEO2: To analyze a problem for knowing its efficiency and decompose it into functions using divide and conquer approach.

Course Outcome: student can able to

CO1	Formulate simple algorithms for arithmetic and logical problems and translate into programs.
CO2	Understand and develop programs using loop, arrays and analyse its complexity.
CO3	Understand and develop programs using strings, functions and recursions.
CO4	Develop programs using pointers and structures, and understand their functionality.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1									
CO2	1	3	2									
CO3	1	3	3									
CO4	2	2	3									

UNIT- I **(10 Hours)**

Programming: Introduction to Structured Programming Approach, Basic structure of C program, C compilers, Compilation and Execution Process, Error debugging.

C Tokens**,** keywords, identifiers, data types, constants, variables, standard I/O statements, Operators classifications**,** Operator precedence and associativity, Implicit and Explicit type casting.

Control Flow Statements: **Selection Logic**: if, if..else, else if ladder, nested if

UNIT- II

(10 Hours)

switch..case, **Iteration Logic:** while, do-while and for loop, break, continue, nested loop.

Arrays: 1-D Array: declaration, initialization, array operations, 2-D Array: declaration, Initialization, 2-D array operations

UNIT- III **(10 Hours)**

Character arrays and Strings: String handling operations, strcmp(), strcat(), strcpy(), strlen().

User Defined Functions: Function categories, Parameter passing in functions, Passing arrays to functions, Recursive functions,storage classes

UNIT- IV **(10 Hours)**

User Defined Data Types: S**tructures**: Declaration and initialization of structures, accessing structure elements , nested structures, structures and arrays, structures and functions, typedef

Pointers: Declaration and initialization of pointers, Pointer arithmetic, Pointer and Arrays, call by value and call by address, Function returning pointer, pointer to structure, Dynamic memory allocation.

Text Books:

1) E. Balaguruswamy, Programming in ANSI C, 7th edition, Tata McGraw-Hill
2) Let us ‘C’ by Yashwant Kanethekar, 16th edition, BPB Publications
3) Byron Gottfried, Schaum's Outline of Programming with C, 3rd edition, McGraw-Hill

References:

1) Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language,2nd edition, Prentice
   Hall of India
2) Programming in C, by Reema Thareja, 2nd edition, OUP India
3) C Programming and Coding by swatisaxena, BPB Publications.

Course Code	Course Title	L	T	P	C	
BESBS1140	**Programming for Problem Solving Laboratory**	**0**	**0**	**4**	**2**	

Pre -Requisite:

Course Educational Objective

CEO1: To develop programs for problems on different applications of array, functions, pointers and structure.

CEO2: To analyse different problems by comparing and implementing in programming.

Course Outcome

CO1	To understand operating system and its simple commands, writing programs, compilation, debug and execution process.
CO2	To develop programs using loop controls, arrays and understand the complexity using different programs.
CO3	To develop programs using functions and recursive function by decomposing a problem and analyse them.
CO4	To Solve numerical problems, develop different programs using pointers, structures and analyse their functionality.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**2**	**3**	**1**									
CO2	**1**	**2**	**2**	**1**								
CO3	**1**	**2**	**2**	**1**								
CO4	**1**	**2**	**2**	**1**								

Lab Experiment 1: Familiarization with programming environment

1) Introduction to OS: Before starting experiments explain the facilities and operations of OS.

2) Introduction to the C compiler, Compilation and Execution Process & writing simple programs.

Lab Experiment 2: Simple computational problems using arithmetic expressions.

1) WAP to input radius of a circle and Find the area, perimeter of it.

2) WAP to input two numbers and swap them without using intermediate variable.

Lab Experiment 3: Simple computational problems using arithmetic expressions.

1) Write a program to accept Fahrenheit and calculate its equivalent Celsius.

2) WAP to input three unequal numbers and find the greatest using conditional operator.

Lab Experiment 4: Problems involving if, switch

1) Write a program to input a lower case alphabet and test whether it is vowel or consonant.(using else..if and switch both)

2) Write a program to find the greatest among three numbers.(using else..if and switch both)

Lab Experiment 5: while, do..while and for loops:

1) Write a program to find the Greatest Common Divisor of two integers using while statement.

2) Write a program to accept a positive integer and test it for Armstrong or not using do..while statement.

Lab Experiment 6: Nested Loop

1) Write a program to calculate the following sum using nested for statement:

Sum = 1-(x^2)/2! +(x^4)/4! – (x^6)/6! + (x^8)/8! – (x^10)/10!

2) Write a program to generate the following pyramid using nested for statement:

```
        1
      1 2 1
    1 2 3 2 1
  1 2 3 4 3 2 1
```

Lab Experiment 7: 1D Array interaction

1) Write a program to accept 10 integers in to an array and find largest and smallest integers present in them.

2) Write a program to input 10 elements into an array. Then search for a given value in the array to know its existence.

Lab Experiment 8: 2D Array interaction

3) Write a program to input values into two matrices A(3x4), B(4x3). Perform matrix multiplication and display the resultant matrix.

4)Write a program to input two strings and test whether they are equal or not using string handling functions.

Lab Experiment 9: User Defined Functions

1) Write a C program which contains three UDF's namely add(), subtract() and multiply(). Each function accepts two integers as their arguments and calculate and return the results

2) Write a program to create an UDF and test a number is prime or not.

Lab Experiment 9: Recursive Functions

1) Write a program to accept 10 elements into an integer array. Find the largest element present using recursive function.

2) Write a program to generate Fibonacci series using a recursive function.

Lab Experiment 10:structures

1) Write a program to store 11 cricket players' details into an array of structure. The structure having member's player name, team name and batting average. Displays the name of players whose batting average is >=30.

2) Write a program to create a structure COMPLEX. Input two complex numbers using UDF and find the sum of them.

Lab Experiment 11: Pointers and Dynamic Memory Allocation

1) Write a program to create user defined function called swap having two integer pointers as its arguments and it has no return value. Call this function using call-by-address.

2) Write a program to store 'n integers using dynamic memory allocation. Find the average value of the integers using a user defined function.

Lab Experiment 12: structure with pointer

1) Write a program create a structure PRODUCT having members Product no, Name and Price. Using a pointer Input 5 product details into a structure array and then display those products whose price is >1000 rupees.

2) Write a program to create a structure EMPLOYEE to store N employee details i.e: employee no, name, salary. Display only those employee names whose salary>=50000.

Teaching Methods: Chalk& Board/ PPT/Video Lecture

- A case study can be given to each student for each UNIT.
- A Mini Project can be given which the student have to do during the semester break.

Text Books:

4) E. Balaguruswamy, Programming in ANSI C, 7th edition, Tata McGraw-Hill
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