

Subject Code : 2CS1010201	Subject Title: Advance Programming Using C
Pre-requisite :	Fundamentals Programming Language 'C'

Course Objective:

This course is intended to develop problem solving skills in students with advance programming skills. Students are expected to learn advance programming concept using C language. The course aims to make the students formulate a complete problem in an advanced programming language and solve it.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
4	1	2	6	70	30	30	20	150

Subject Contents				
Sr. No	Topics	Total Hours	Weight (%)	
1	User-Defined Functions: Introduction, Need for user-defined functions, Arguments and return types, Classifications of function using arguments and return types, Nesting of functions, Recursion, Functions with arrays, The scope and lifetime of variables in functions	9	20	
2	Structures and Unions: Introduction, Structure definition, Giving values to members, Structure initialization, Comparison of structures variables, Arrays of structures, Arrays within structures, Structures within Structures, Structures and functions, Unions, Size of structures, Bit fields.	9	20	
3	Pointers: Introduction, Understanding pointers, Accessing the address of a variable, Declaring and initializing pointers, Accessing a variable through pointer, Pointer expressions, Pointer increments and scale factor, Pointers and arrays, Pointers and character strings, Pointers and Functions, Pointers and structures.	9	20	
4	File Management in C: Introduction, Defining, creating and opening a file, Closing a file, Input / Output operations on files, Error handling during I/O operations, Random access files, Command line arguments. Dynamic Memory Allocation: Introduction, Dynamic Memory allocation, Memory allocation functions (malloc, calloc etc). Basic linked list operations.	9	20	
5	The Preprocessors: Introduction, Types of Preprocessors Directives. Macro: Introduction, Format of Macro, Simple Macro Substitution, Argument Macro Substitution, Nested Macro Substitution, File inclusion, Compiler control directives	9	20	

Course outcomes:

At the end of this course, the student would be able

- To understand the concept of software modules (using function).
- To use by structure, unions and pointers in designing application in C
- To apply the knowledge of the advance concepts in using dynamic memory allocation
- To understand store/retrieve data to/from files on auxiliary memory

List of References:

1. Programming in ANSI C, By E Balaguruswami, Tata McGraw-Hill Publishing Company Limited.
2. Programming with C, By Bayron Gottfried, Tata McGraw-Hill Edition.
3. Let Us C, By Yashavant Kanetkar, BPB Publications.
4. Working with C, By Yashavant Kanetkar, BPB Publications.
5. C in Depth, By Suresh K. Srivastava, BPB Publications.
6. Programming in C, by Reema Thareja Publisher – Oxford.

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

1. Write a program to check the given number is Palindrome or not using User Defined Function (UDF).
2. Write a program to find factorial of given no using UDF.
3. Write a program to find factorial of given no using recursion.
4. Write a program to display first 25 terms of Fibonacci series using recursion.
5. Write a program using a recursive function to find the GCD (Greatest Common Divisor) of two Positive integer numbers.
6. Write a program to swap value of two integer number using UDF
7. Write a function prime that returns 1 if its argument is a prime and return zero Otherwise.
8. Write a program that will print the longest word written in a line using UDF.
9. Write a program that will scan a character string passed as an argument and convert all Lowercase character into their uppercase equivalents using UDF.
10. Write a program that uses a UDF to sort an array of integer.
11. Write a program to search a number within an array using UDF.
12. Write a program which explains the use of nesting of functions.
13. Write a function power that computes x raised to the power y for integers x and y and return Double-type value.
14. Define a structure type struct personal that would contain person name, date of joining and salary using this structure to read this information and Display on screen.
15. Design a structure student_records to contain Roll_no, Name, City and Percentage obtained. Develop a program to read data for 5 students and Display them.
16. Write a program using structure within structure.
17. Write a program using structure within Function.
18. Write a program declare following structure member: name, code, age, weight and height. Read all members of the structure for 10 persons and find list of persons with all related data whose weight > 50 and height > 40 and print the same with suitable format and title.
19. Write a program to print the value and address of the element.
20. Write a program to use of pointer in arithmetic operation.
21. Write a program to accept 10 numbers and display its sum using pointer.
22. Write a program to accept 10 numbers and sort them with use of pointer.
23. Write a program to swap the two values using pointers and UDF.

24. Write a program with structure and pointer.
25. Write a program using pointer to determine the length of a character string.
26. Write a program using pointers to read an array of integers and print its elements in reverse order.
27. Write a program using UDF and pointers to add two matrices and to return the resultant matrix to the calling function.
28. Create one text file store some information into it and print the same information on Terminal.
29. A file named data contains series of integer no. Write a c program to read that no. and then Write all odd no into file named odd no. and write all even no into file named even no. Display all the contents of these file on screen.
30. Write a c program to read data from keyboard, write it to a file called input and Display data of input file on the screen.
31. Write a program that counts the number of characters and number of lines in a file.
32. Write a c program to read mark data which contains roll no, name, sub1, sub2, sub3 file and generate the annual examination results are tabulated as follows:
Result

Roll no Name Sub1 Sub2 Sub3 Total per% Class

33. Write a c program to input employee no, employee name and basic and to store output into empdata file in following format.
A/c Department

Emp-No Name Basic DA HRA MA PF GROSS NET-PAY

1 xyz 5000 2500 500 100 500 8100 7600
2
3

DA = 50% of Basic HRA = 10% of Basic

MA = 100 PF = 10% of Basic

GROSS = BASIC + DA + HRA + MA NET-PAY = GROSS – PF

34. Write a c program to read empin data file which contains empno, empname and basic. To create empout data file as per practical no 33 format.
35. Write a program using fseek and ftell functions.
36. Two files DATA1 and DATA2 contain sorted lists of integers. Write a program to produce a third file DATA which holds a single sorted, merged list of these two lists. Use command line arguments to specify the file names.
37. Write a program to work as a dos copy con command using command line argument.
38. Write a C program to work as a dos type command using command line argument.
39. Write a C program to work as a dos copy command using command line argument.
40. Write programs which explain the use of memory allocation functions.
41. Write a program which explains the use of macro.