

Program : Diploma in Computer Engineering / Computer Hardware Engineering	
Course Code : 3132	Course Title: Programming in C
Semester : 3	Credits: 3
Course Category: Program Core	
Periods per week: 3 (L:3 T:0 P:0)	Periods per semester: 45

Course Objectives:

- Provide a thorough knowledge in Programming using C Language.
- Develop programming skills using arrays, pointers, structures and files to solve real world problems.
- Build the necessary foundation for system programming and other advanced programming courses.

Course Prerequisites:

Topic	Course code	Course name	Semester
Basic knowledge on problem solving and programming concepts.		Problem Solving and Programming	2

Course Outcomes:

On completion of the course student will be able to:

CO _n	Description	Duration (Hours)	Cognitive Level
CO1	Make use of the basic programming concepts – sequential, conditional, looping structures and functions in C.	11	Applying
CO2	Make use of the concept of arrays to solve real world problems.	11	Applying
CO3	Develop programs using Pointers to solve problems more efficiently.	10	Applying
CO4	Construct user defined data types using structure, union and files.	11	Applying

	Series Test	2	
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CO – PO Mapping:

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO1	3						
CO2	3						
CO3	3						
CO4	3						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

	Description	Duration (Hours)	Cognitive Level
CO1	Make use of the basic programming concepts – sequential, conditional, unconditional, looping structures and functions in C.		
M1.01	Summarize the basic programming concepts in C – sequential, conditional, unconditional and control structures in C	2	Understanding.
M1.02	Explain the concept of preprocessing	1	Understanding
M1.03	Summarize the concepts of modular programming concepts in C	1	Understanding
M1.04	Develop programs using functions	1	Applying
M1.05	Explain Storage class, Lifetime and Visibility of Variables	1	Understanding.
M1.06	Develop programs using the concepts of storage class and scope rules	2	Applying
M1.07	Illustrate the recursion with examples	1	Understanding.
M1.08	Develop programs using recursion.	2	Applying.

Contents: Recall basic programming concepts – C program structure, selection structure and repetition structures. Function – Declarations, prototype, definition, function call, storage class, lifetime and visibility of variables. Preprocessor – file inclusion – macro substitution Recursion – Recursive definition of a problem, Implementation of programs using recursion.			
CO2:	Make use of the concept of arrays to solve real world problems.		
M2.01	Summarize the definition, initialization and accessing of single and multi dimensional arrays.	1	Understanding.
M2.02	Develop programs using single and multidimensional arrays	1	Applying
M2.03	Illustrate the concept of divide and conquer method in solving problems.	1	Understanding.
M2.04	Develop C programs to implement searching (linear search and binary search) and sorting (selection sort and quicksort) algorithms.	2	Applying.
M2.05	Explain the representation of strings in C	1	Understanding.
M2.06	Develop C programs to perform different operations on strings	3	Applying
M2.07	Illustrate passing arrays as parameters to a function	2	Understanding.
	Series Test – I	1	
Contents: Arrays – definition, initialization and processing of arrays – Searching algorithms – Linear search, Binary Search, Sorting algorithms – Selection sort, Quick sort, Passing arrays to functions - Strings – Representation of strings in C – String input and output - String processing – copy, concatenate, length, comparison, pattern searching etc - builtin String functions – Implementation of string functions.			
CO3:	Develop programs using Pointers to solve problems more efficiently.		
M3.01	Explain the concept of pointers and operations on pointers with examples	2	Understanding
M3.02	Illustrate the advantage of passing pointers to functions	1	Understanding

M3.03	Explain dynamic memory allocation concepts in C	1	Understanding
M3.04	Explain the relationship of arrays and pointers	2	Understanding
M3.05	Develop programs for single and multi-dimensional arrays using pointers.	4	Applying

Contents: Pointers – Fundamentals – declaration, Initialization, accessing of pointer variables -Pointer arithmetic – Passing pointers to Functions – dynamic memory allocation - Arrays and Pointers - Strings and Pointers – Array of Pointers.

CO4:	Construct user defined data types using structure, union and files.		
M4.01	Explain the definition, declaration and processing of structure data type	1	Understanding
M4.02	Develop programs using structure to solve problems	2	Applying
M4.03	Illustrate the array of structure with examples	1	Understanding
M4.04	Illustrate passing of structure as parameters to a function.	1	Understanding
M4.05	Utilize pointers to process structure data type.	1	Applying
M4.06	Explain features of union data type, enumerations	1	Understanding
M4.07	Illustrate the use of file as data storage, input and output to programs.	3	Understanding.
M4.08	Illustrate command line arguments	1	Understanding
	Series Test – II	1	

Contents:

Structure – declaration, definition and initialization of structure variables, Accessing of structure elements – Array of structure – Structure and Pointer – Structure and Function – Union - enumerations.

File – Defining, opening, closing a file - input and output operations on sequential files - Command Line arguments.

Text / Reference

T/R	Book Title/Author
T1	Balagurusamy E, Programming in ANSI C 7 th Ed.
R1	Yashavant Kanetkar, Let Us C
R2	Paul J. Deitel, Harvey Deitel, C How to Program
R3	Brian W. Kernighan, Dennis M. Ritchie, C Programming Language , 2 nd Edition 2 nd Ed.
R4	Herbert Schild, C: The Complete Reference
R5	Byron Gottfried - Schaum's Outline Of Programming With C

Online Resources

Sl.No	Website Link
1	https://nptel.ac.in/courses/106104128/
2	https://www.programiz.com/c-programming
3	https://www.tutorialspoint.com/cprogramming/index.htm