Program : **Diploma in Computer Engineering / Computer Hardware Engineering**	
Course Code : **3135**	Course Title: **Programming in C Lab**
Semester :**3**	Credits: **1.5**
Course Category: **Program Core**	
Periods per week: **3 (L:0 T:0 P:3)**	Periods per semester: **45**

Course Objectives:

- Acquire in depth experience in programming using C Language.
- Analyse the problems given in general terms, outline solutions and transform into well organised programs using arrays, functions, structures and files.
- Lay foundation for further courses like Data Structure, Object Oriented Programming, Embedded systems, etc. and software development.

Course Prerequisites:

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

Course Outcomes:

On completion of the course student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Develop user defined functions and recursive functions to implement modular programming concepts.	8	Applying
CO2	Use one and two dimensional arrays in C to solve problems.	12	Applying
CO3	Make use of Pointers, structures to solve problems.	12	Applying
CO4	Utilize files and command line arguments as I/O to programs.	10	Applying
	Lab Exam	3	

CO – PO Mapping:

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

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

Course Outline

	Name of the Experiment	Duration (Hours)	Cognitive Level
CO1	Develop user defined functions and recursive functions to implement modular programming concepts.		
M1.01	Experiment with sequential and control structures in C	2	Applying
M1.02	Develop C programs using user defined functions	2	Applying
M1.03	Develop functions using recursion to solve problems	4	Applying
CO2	Use one and two dimensional arrays in C to solve real world problems.		
M2.01	Develop C programs to solve problems using one dimensional arrays.	2	Applying
M2.02	Develop C programs to implement searching (linear search and binary search) and sorting (selection sort and quicksort) algorithms.	2	Applying
M2.03	Develop C programs to solve problems using two dimensional arrays.	2	Applying
M2.04	Develop C programs to perform different operations on strings	4	Applying
M2.05	Experiment with programs by Passing arrays as function arguments	2	Applying
	Lab Exam – I	1½	
CO3	Make use of pointers and structures to solve problems.		
M3.01	Develop programs using pointers.	2	Applying

M3.02	Develop programs using pointers as function arguments	2	Applying
M3.03	Experiment with single dimensional and multi dimensional array programs by dynamic memory allocation.	4	Applying
M3.04	Develop programs using structure and array of structures	4	Applying
CO4	Illustrate the use of files and command line arguments as I/O to programs.		
M4.01	Develop programs using files and command line arguments	4	Applying
M4.02	Open Ended Experiments -**	6	Applying
	Lab Exam – II	1½	

**** - Sample Open Ended Experiments**

(Not for End Semester Examination but compulsory to be included in Continuous Internal Evaluation. Students can do open ended experiments as a group of 2-3. There is no duplication in experiments between groups. Open ended experiments should include the concepts of arrays, functions and structures)

1) Write a menu based program for payroll management.
2) Write a menu based program for Banking Application.

Text / Reference

T/R	Book Title/Author
T1	Balagurusamy E, **Programming in ANSI C** 7th Ed.
R1	Byron Gottfried, **Programming with C**, 2nd Ed.
R2	YashavantKanetkar, **Let Us C**
R3	Paul J. Deitel, HarveyDeitel, **C How to Program**
R4	Herbert Schild**, C: The Complete Reference**

Online Resources

S.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