19CS108 COMPUTER PROGRAMING AND DATA STRUCTURES

Hours Per Week :

L	T	P	C
1	0	4	3

Total Hours :

L	T	P
15	-	60

WA/RA	SSH/HSH	CS	SA	S	BS
20	30	-	5	-	5

Source :

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COURSE DESCRIPTION AND OBJECTIVES:

To provide exposure to develop small programs in C language and thus equip them to solve problems in their chosen field of study using computer program.

COURSE OUTCOMES:

Upon completion of the course, student will able to achieve the following outcomes:

COs	Course Outcomes	POs
1	Understand the basic terminology used in computer programming to write, compile & debug programs in 'C' language.	1
2	Apply different data types to design programs involving decisions, loops and functions.	3
3	Create new programs for specific applications.	3
4	Apply various headers for specific purpose.	5

SKILLS:

- ✓ *Familiarise with basic keyword and logic used for programming tool.*
- ✓ *Develop algorithms for real time applications.*
- ✓ *Coping up with any programming tool.*

UNIT - I **L-03**

Introduction to high level languages: Introduction to C - History of C - Development environment of C- structure of C program - C tokens & keywords- Primary data types, Variables, constants, character constants, length of data types, header files - use of header files. C operators, building and evaluating arithmetic expressions, type conversions, type casting.

UNIT - II **L-03**

Relational operators, logical operators: Standard library functions. Input statement, output statement, formatted output; importance of documentation. Decision making - branching, if statement, Nested if, switch statement, go to statement. Looping - while, do- while, nested loops, for loop, nested for loop, break, continue statements.

UNIT - III **L-03**

Arrays: One dimensional array representation, sorting, searching. Two dimensional arrays - matrix representation, matrix operations. arrays, representing strings, string operations, string library functions.

UNIT - IV **L-03**

User defined functions: Passing arguments, returning values, recursive functions, storage class, scope and visibility of variables, local & global variables. User defined data types, structures, unions, arrays of structures, structures in user defined functions.

UNIT - **L-03**

Introduction to pointers: Passing arguments by address using pointers - pointer representation ofarrays, Dynamic Memory allocation functions, self-referential structures, singly linked list, Insertion, deletion operations of singly linked list, applications of singly linked list, Stacks, array representation of stacks, push/pop operations,Queues, Array representation of queue - deletion/insertion of queues.

LABORATORY EXPERIMENTS

LIST OF EXPERIMENTS **Total hours-60**

1. Simple C- programs using operators and output statements.
2. Programs using input statement and mathematical equations.
3. Programs with library functions and if statements.
4. Development of programs with if statement.
5. Development of programs with nested if.
6. Programs with switch statements.
7. Illustrating type casting, go to statement.
8. While loop example programs.
9. Do-while loop programs.
10. Nested loops with while.
11. Nested loops with do-while statements.
12. Programs with for loops.
13. Nested usages loop illustration programs.
14. Break, continue statements.

15. One dimensional array creation and calculations and printing.
16. Array sorting - bubble sort.
17. Searching of array.
18. Creating user defined functions with return types.
19. Functions of various return types and parameters.
20. Programs with structures.
21. Programs to illustrate pointers.
22. Functions passing parameters by address.
23. Functions passing structures as parameters.
24. Dynamic memory allocation functions.
25. Self-referential structures.
26. Linked lists - insertion/deletion of linked lists.
27. Stacks - array representation.
28. Push/pop operations.
29. Queues - insertion deletion operations
30. Practical examinations.

TEXT BOOK :

1. Balagurusamy E. 1990, “Programming in ‘C’”. Tata-McGraw Hill Publishing Co. Ltd., 10/4Asaf Ali Road, New Delhi.

REFERENCE BOOKS:

1. Rajaraman V. 1985, “Computer Oriented Numerical Methods”. Prentice Hall of India. Pvt.Ltd., New Delhi.
2. Rajaraman V. 1995, “Computer Programming in ‘C’”. Prentice Hall of India Pvt.Ltd., New Delhi.