



**Paper Code : PPC:104**

**Paper name : PROGRAMMING AND PROBLEM SOLVING THROUGH 'C' LANGUAGE**

**Objective of the Course**

The objectives of this course are to make the student understand programming language, programming, concepts of Loops, reading a set of Data, stepwise refinement, Functions, Control structure, Arrays. After completion of this course the student is expected to analyze the real life problem and write a program in 'C' language to solve the problem. The main emphasis of the course will be on problem solving aspect i.e. developing proper algorithms.

After completion of the course the student will be able to

- Develop efficient algorithms for solving a problem.
- Use the various constructs of a programming language viz. conditional, iteration and recursion.
- Implement the algorithms in "C" language.
- Use simple data structures like arrays, stacks and linked list in solving problems.
- Handling File in "C".

Teaching Hours (Per Week)		Examination Scheme		
TH. (hours)	Pr. (hours)	Internal	External	Total
4		Th. (marks)	Th. (marks)	100 (marks)
		30	70	

**Lectures = 68 Hours**

**Detailed Syllabus**

**UNIT I**

**Introduction to Programming 04 Hrs.**

How to develop a program, Algorithms, Flow-charts, Types of Programming Languages, Compiler and Linker, Testing and Debugging a program, Documentation.

**Constants, Variables & Data Types 04 Hrs.**

Character set, C Tokens, Identifiers and Keywords, Constants, Variables, Data types, Declaration of variables, declaration of storage class, assigning values to variables, defining symbolic constants, declaring a variable as constant, declaring a variable as volatile, overflow and underflow of data.

**Operators & Expressions 07 Hrs**



Arithmetic operators, Relational, Logical operators, Assignment, increment and decrement operators, conditional operators, bitwise operators, special operators, arithmetic expressions, evaluation of arithmetic expressions, precedence of arithmetic expressions, some computational problems, type conversion in expressions, operator precedence and associativity, mathematical functions.

**Managing Input & output operations** **02 Hrs**

Reading a character, writing a character, formatted input, formatted output.

**UNIT II**

**Decision Making – Branching & Looping** **06 Hrs.**

Decision making with IF statement, switch statement, ? : operator, goto statement.

While statement, do-while statement, for statement, Jumps in loops,

**Arrays** **05 Hrs.**

One dimensional array: Array Manipulation, Different operations on one dimensional arrays, two dimensional array, operations on two dimensional arrays, multi-dimensional array, dynamic arrays.

**Handling of Character Strings** **05Hrs**

Declaring and initializing string variables, reading string from terminal, writing string to screen, putting strings together, comparison of two strings, string handling functions, table of strings.

**UNIT III**

**Functions** **08 Hrs.**

Top down approach of problem solving, standard library functions, passing values between functions, scope rules of functions, calling convention, return type of functions, call by value and call by reference, recursive functions.

**Storage Classes**

Scope and extent, Storage Classes in a single source file: auto, extern and static, register,

**Structures and Unions** **07 Hrs.**

Defining a structure, Declaring Structure variables, accessing structure members, structure initialisation, copying and comparing structure variables, operation on individual members, arrays of structures, arrays within structures, structures and functions, union, size of structure, bit fields.

**UNIT IV**

**Pointers** **09 Hrs.**

Understanding pointers, accessing the address of a variable, declaring pointer variables, initialisation of pointer variables, accessing a variable through its pointer, chain of pointers, pointer expression,



pointer increment and scale factor, pointer and arrays, pointers and character strings, array of pointers, pointers as function arguments, functions returning pointers, pointers to functions, pointers and structures.

**Dynamic Memory Allocation and Link List**

**06 Hrs.**

Dynamic Memory Allocation, Allocation a Block of memory: malloc, allocating multiple blocks of memory: calloc, releasing the used space: free, Altering the size of a block: realloc.

Concept of Link list, advantages of link lists, types of link list, pointers revisited, creating a linked list, inserting an item, deleting an item, application of linked lists.

**UNIT V**

**File Processing**

**05 Hrs.**

Defining and Opening a file, closing a file, input/output operations on files, error handling during I/O operations, random access to files, Command Line Arguments.

**RECOMMENDED BOOKS**

**MAIN READING**

1. E. Balagurusamy, "Programming with ANSI-C", Fourth Edition, 2008, Tata McGraw Hill.
2. R.G. Dromey, "How to solve it by Computer", Pearson Education, 2008.
3. Kanetkar Y, "Let us C", BPB Publications, 2007.
4. Hanly J R & Koffman E.B, "Problem Solving and Programm design in C", Pearson Education, 2009.

**SUPPLEMENTARY READING**

1. Byron S Gottfried "Programming with C" Second edition, Tata McGrawhill, 2007
2. Venugopal K. R and Prasad S. R, "Mastering 'C'", Third Edition, 2008, Tata McGrawHill.
3. B.W. Kernighan & D. M. Ritchie, "The C Programming Language", Second Edition, 2001, Pearson Education
4. ISRD Group, "Programming and Problem Solving Using C", Tata McGraw Hill, 2008.
5. PradipDey, ManasGhosh, "Programming in C", Oxford University Press, 2007.