

# G.L. Bajaj Institute of Technology and Management, Greater Noida

## Career Development Centre

Modules - Technical Training

### Module 0 – Basic & Advanced Concepts of Programming Using C

#### Course Outcomes:

1. Understand fundamental programming concepts such as data types, storage classes, operators, and control structures.
2. Write structured and modular C programs using functions and recursion.
3. Manipulate arrays, pointers, and structures effectively to manage data in memory.
4. Solve programming problems using basic algorithms and logical constructs.
5. Gain proficiency in debugging and optimizing simple C programs.

#### List of topics :

| Sr. No. | Name of Topic                                                                    | Industry Application                                                                          | No. of Lectures (hrs) |
|---------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------|
| 1       | <b>Data Types</b>                                                                | Memory optimization, typecasting in embedded systems, and efficient data handling in software | 3                     |
| 2       | <b>Storage Classes (auto, register, static, extern)</b>                          | Memory management, embedded programming, firmware development                                 | 2                     |
| 3       | <b>Operators (arithmetic, relational, logical, bitwise, assignment, ternary)</b> | Control flow, algorithm design, optimizing calculations in systems                            | 3                     |
| 4       | <b>Control Statements (if, switch, loops – for, while, do-while)</b>             | Decision-making, iterative processes in simulations and real-time systems                     | 4                     |
| 5       | <b>Function (declaration, definition, parameter passing, return values)</b>      | Modular programming, reusable code, API development                                           | 3                     |
| 6       | <b>Recursion</b>                                                                 | Divide and conquer algorithms, AI search problems, mathematical computations                  | 3                     |
| 7       | <b>Pointer Basics (declaration, dereferencing, pointer arithmetic)</b>           | Dynamic memory allocation, system programming, performance-critical applications              | 3                     |
| 8       | <b>Array Basics (declaration, initialization, traversal)</b>                     | Data storage, buffer handling, numerical computations                                         | 3                     |
| 9       | <b>Structure (structs and nested structures)</b>                                 | Modeling complex data, communication protocols, file handling                                 | 3                     |
| 10      | <b>Integration Assignment</b>                                                    | Real-world mini projects such as implementing data structures and algorithms                  | 3                     |