Syllabus for Programming (Phase I) :

1. Introduction
- Data types
- Operators (Bit wise, Logical)
- Loops

2. Arrays
- Array (1D, 2D, 3D)
- Strings, String Header File, String Operations
- Sort (Selection, bubble, insertion, merge, quick)

3. Pointers
- Concept of Pointers

4. File Handling
- File declaration
- File Operations (Input/output, Read/write)

5. Variables
- Macros
- Storage Type (auto, external, register, static)

6. Algorithms – Divide and Conquer
- Binary search
- Interpolation search

7. OOP's
- Class concept (PIE Overloading)
- Constructors and destructors
- Inheritance

Syllabus for Programming (Phase II – DATA STRUCTURES) :

1. Complexity
- Time space complexity
- Algorithm design

2. Arrays and String
- Arrays using pointers

3. Stacks and Queues
- Basics
- Array Representation
- Application
- Stack Problems (Recursion basic, Polish expression, Compilation conversion infix expression to prefix and postfix)
- Queue Problems

4. Linked List
- Singly Linked List
- Linked List operations (Traversing, Insertion, deletion, searching)
- Linked List problems
- Circular and Doubly linked list
- Stacks and Queue as Linked List

5. Trees
- Basic – what are trees
- Binary trees and their Representations
- Binary search Trees (Operations : Insertion, deletion, traversing – in order, post order, pre order)
- Applications of BST
- Complete Binary trees
- Extended Binary trees
- AVL trees
- Threaded trees
- B-trees

6. Hashing
- Hash maps
- Hash Functions
- Indexing and Hashing

7. Searching and Sorting
- Interpolation search
- Heap sort
- Merge sort
- Sorting on different keys
- External sorting

8. Graphs
- Representation (Class , STL (hashing) , 2-D array)
- Graph traversal (BFS, DFS)
- Shortest path algorithms
- Minimum spanning tree algorithms
- Transitive closure's
- Topological sort
- Critical Paths

Syllabus for Programming (Phase III – OOPS) :

1. Classes and Objects
- Constant objects and constructors
- Constructor overloading
- Nested classes
- Static members

2. Dynamic Objects
- Pointers to objects
- Array of objects
- Pointer to object members
- This pointer

3. Operator Overloading and Inheritance
- Overloading of new and delete operators
- Conversion between objects and basic types
- Conversion between objects of different classes
- Friend functions (and friend func. Overloading)
- Abstract classes
- Inheritance types
- Virtual Base classes
- Virtual Functions
- Pointers to derived class objects
- Pure virtual functions
- Virtual Destructors

4. Generic programming (Templates)
- Introduction
- Function template
- Overloaded function templates
- Class templates and Template inheritance
- Class template with overloaded operators
- Class template containership

5. Basic
- Type conversion and casting, type promotions
- Access specifiers : public, private, protected
- STL (Math, string, vector, List, stack , Queue, Map, set)

6. Error Handling
- Exception types
- nested try catch
- throw

Syllabus for Programming (Phase IV – DISCRETE CONCEPTS) :

1. Algorithm analysis
- Recursion
- Linear and first order recursion

2. Boolean Algebra
- Boolean Matrices
- Boolean matrices multiplication
- Lattices
- Direct Product

- Homomorphism
- isomorphic structures
- Boolean function
- minimization of Boolean functions

3. Graph theory
- Isomorphic graphs
- Euler's formula (Four color problem, five color theorem)
- Warshall's algorithm
- Decision trees
- Euler paths and Hamiltonian Circuits
- Shortest Path and Minimum spanning tress – Prims and Kruskal algorithms , Djikstra's and Bellman ford
- Depth first and Breadth first search
- Tree traversal algorithms

Syllabus for Programming (Phase V – ALGORITMS) :

1. Growth
- Asymptotic notations
- Time constraints
- Master's theorem

2. Searching and sorting
- Strassen Matrix multiplication
- Merge sort, heap sort

3. Greedy Method
- Minimum cost spanning tee
- Knapsack problem
- Kruskal's algorithm
- Prim's algorithm
- Djikstra's algo
- Bellman ford
- Huffman Coding
- Activity selection problem

4. Dynammic programming
- Principles (Recursion , memorization and DP)
- Rod cutting problem
- Floyd- warshall algorithm
- Matrix multiplication
- Travelling salesman problem
- Longest common subsequence

5. Back Tracking
- 8-Queen problem
- Knapsack problem

- Travelling salesman problem

6. Branch and Bound
- LC searching bounding
- FIFO branch and Bound
- 0/1 Knapsack
- Travelling salesman

NOW GO FOR COMPETITIVE