Anant Webtics Programming Languages Complete Syllabus

1. C Programming Syllabus

A. Basics

- Introduction to C, History, Features
- Structure of a C program
- Compilation and Execution process
- Data types, Constants, Variables
- Operators (Arithmetic, Relational, Logical, Bitwise, Assignment, Miscellaneous)

B. Control Structures

- Conditional statements (`if`, `if-else`, `switch`)
- Loops (`for`, `while`, `do-while`)
- Nested loops
- `break`, `continue`, `goto`

C. Functions

- Defining and Calling Functions
- Function Arguments (Pass by value, Pass by reference)
- Recursion

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- Library Functions

D. Arrays & Strings

- One-dimensional and Multi-dimensional arrays
- String handling and string functions
- Array of strings

E. Pointers

- Pointer basics and types
- Pointer arithmetic
- Pointers and arrays
- Pointers and functions
- Dynamic memory allocation (`malloc`, `calloc`, `free`, `realloc`)

F. Structures & Unions

- Structure declaration, initialization, and accessing members
- Nested structures
- Array of structures
- Unions and differences with structures

G. File Handling

- File operations (`fopen`, `fclose`, `fread`, `fwrite`, `fprintf`, `fscanf`)
- File modes

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- Error handling in files

H. Advanced Topics

- Preprocessor directives
- Macros
- Typedef and Enumerations

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2. C++ Programming Syllabus

A. Basics

- C++ Introduction, Features, Comparison with C
- Input/Output (`cin`, `cout`)
- Variables, Constants, Data types, Operators

B. Object-Oriented Programming

- Classes and Objects
- Constructors and Destructors
- Access specifiers (private, public, protected)
- `this` pointer

C. Functions

- Function overloading
- Inline functions
- Friend functions
- Static members

D. Inheritance

- Types of inheritance (Single, Multiple, Multilevel, Hierarchical, Hybrid)
- Virtual base class
- Overriding methods

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E. Polymorphism

- Compile-time polymorphism
- Runtime polymorphism
- Virtual functions and abstract classes

F. Operator Overloading

- Overloading binary and unary operators
- Overloading `new` and `delete`

G. Templates & Exception Handling

- Function and Class templates
- Exception handling (`try`, `catch`, `throw`)

H. STL (Standard Template Library)

- Containers: Vector, List, Deque, Set, Map
- Iterators and Algorithms

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3. Python Programming Syllabus

A. Basics

- Python Introduction, Features, Installation
- Python IDEs
- Variables, Constants, Data types
- Operators (Arithmetic, Relational, Logical, Assignment, Bitwise)

B. Control Structures

- `if`, `elif`, `else`
- Loops: `for`, `while`
- `break`, `continue`, `pass`

C. Functions & Modules

- Defining and calling functions
- Function arguments and return values
- Lambda functions
- Modules and Packages
- `import`, `from ... import`

D. Data Structures

- List, Tuple, Dictionary, Set
- List comprehension

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- Dictionary comprehension
- String handling

E. Object-Oriented Programming

- Classes and Objects
- Constructors (`__init__`)
- Methods, Class and Static methods
- Inheritance, Polymorphism
- Encapsulation

F. File Handling

- Reading/Writing text and binary files
- Context manager (`with` statement)

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G. Exception Handling

- `try`, `except`, `finally`
- Raising exceptions
- Custom exceptions

H. Advanced Topics

- Decorators
- Generators
- Iterators

- Regular Expressions
- Working with JSON, CSV

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4. Java Programming Syllabus

A. Basics

- Java Introduction, Features
- JDK, JVM, JRE
- Structure of Java Program
- Data types, Variables, Operators

B. Control Statements

- `if`, `if-else`, `switch`
- Loops (`for`, `while`, `do-while`)
- `break`, `continue`

C. OOP Concepts

- Classes and Objects
- Constructors
- Method Overloading and Overriding
- `this` keyword
- `super` keyword

D. Inheritance

- Single, Multilevel, Hierarchical, Hybrid
- `final` keyword

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- `abstract` classes and methods

E. Polymorphism

- Compile-time polymorphism
- Runtime polymorphism (Dynamic Method Dispatch)

F. Interfaces & Packages

- Interface declaration
- Implementing interfaces
- Packages and Access Modifiers

G. Exception Handling

- `try`, `catch`, `finally`
- Multiple exceptions
- Custom exceptions

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H. Collections & Generics

- ArrayList, LinkedList, HashMap, HashSet
- Generics in Java
- Iterators

I. File Handling & Streams

- File class

- FileReader, FileWriter, BufferedReader, BufferedWriter
- Serialization

J. Multithreading

- Thread class and Runnable interface
- Synchronization

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5. JavaScript Syllabus

A. Basics

- Introduction to JavaScript, Features
- Embedding JavaScript in HTML
- Variables (`var`, `let`, `const`)
- Data types
- Operators

B. Control Flow

- `if`, `else if`, `else`, `switch`
- Loops: `for`, `while`, `do-while`, `for...of`, `for...in`

C. Functions

- Function declaration and expressions
- Arrow functions
- Callback functions
- Default parameters

D. Objects & Arrays

- Objects and Object Literals
- Arrays and array methods (`push`, `pop`, `shift`, `unshift`, `map`, `filter`, `reduce`)

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- Destructuring

E. DOM Manipulation

- Document Object Model (DOM)
- `getElementById`, `querySelector`, `getElementsByClassName`
- Event handling (`addEventListener`)
- Changing styles, attributes, and content

F. Advanced JavaScript

- Scope (Global, Local, Block)
- Hoisting
- Closures
- `this` keyword
- Prototypes and Inheritance
- ES6 Features (Template literals, Spread/rest operator, Classes, Modules)

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G. Asynchronous JavaScript

- Callbacks
- Promises
- Async/Await
- Fetch API and AJAX

H. Browser Storage

- Cookies, LocalStorage, SessionStorage