Syllabus

C++ Programming - 72 Hours

- Getting Started
- Operators & Expressions
- Conditional and Looping Statements
- Functions in C++
- Memory Management and Pointers
- OOP Concepts using C++
- Constructor and Destructor
- Inheritance
- Polymorphism
- Virtual Functions & Abstract Class
- Exception Handling
- Managing Console I/O Operations
- File Handling in C++ & Templates
- STL
- RTTI

Concepts of Operating System & Software Development Methodologies - 72 Hours

Concepts of Operating Systems

- Introduction to OS
- Introduction to Linux
- Shell Programming
- Processes
- Memory management
- Virtual Memory
- Deadlock.

Software Development Methodologies

- Git
- Software Engineering
- Software Development Life Cycle
- Object Oriented Analysis and Design
- Agile development model
- Introduction to Atlassian Jira
- Microservices
- API gateway
- DevOps
- Containerisation
- Docker

- YAML
- Kubernetes
- Software testing
- STLC and V Model
- Manual & Automation testing
- Selenium
- Jenkins

Object Oriented Programming With JAVA - 112 Hours

- Introduction to Java
- JVM Architecture
- Primitive data types
- OOP Concepts using Java
- Interfaces
- Arrays
- Garbage collection
- Inner Class
- Wrapper Classes and String Class
- Exception Handling
- java.io & java.nio Package
- Object Class & java.util Package
- Collections
- MultiThreading
- Synchronization
- Lambada Expression

Algorithm and Data Structures (Using JAVA) - 72 Hours

- Problem Solving & Computational Thinking
- Algorithms & Data
- Structures
- Basic Data Structures
- Linked List Data Structures
- Recursion
- Trees & Applications
- Searching Algorithms
- Searching Algorithms
- Sorting Algorithms
- Hash Functions & Hash Tables
- Graph & Applications
- Algorithm Designs
- Analysis of different type of Algorithms
- Data Structure Implementation and Applications

Database Technologies - 72 Hours

- DBMS

- MySQL
- Database Design
- Entity-Relationship Diagram
- Codd's 12 rules for RDBMS
- SQL
- Categories of SQL Commands
- Normalization
- MySQL Data Types
- Database Constraints
- SQL Functions & Operators
- Joins
- Subquery
- Views & Indexes
- ACID Properties
- Stored Procedures
- Cursors
- Triggers
- Introduction to NoSQL
- MongoDB

Web Programming Technologies - 112 Hours

- Architecture of Web
- HTML
- Cascading Style Sheets (CSS)
- Responsive Web Design & Web Security
- JavaScript
- jQuery
- JSON & Ajax
- Node.js
- Node.js Asynchronous Programming
- Node.js Modules
- Node.js – fs & http
- Introduction to Express
- React
- Introduction to React-Redux

Web Based JAVA Programming - 104 Hours

- J2EE Overview
- Servlets
- JSP
- JDBC & Transaction Management
- Hibernate Framework
- Sessions
- Spring Framework
- Spring Boot

- Spring Data Module
- Spring AOP
- Building REST Services with Spring
- Testing in Spring
- Securing Web Application with Spring Security

Microsoft .Net Technologies - 84 Hours

- .Net Framework
- Visual Studio
- C# Basics
- Interfaces & Indexers
- Generic classes
- Collections
- Delegates
- Lambdas
- Error Handling (Exceptions Handling)
- LINQ to objects
- PLINQ
- Files I/O and Streams
- Threading Asp.Net MVC
- MVC State Management
- MVC Module
- Data Management with ADO.NET
- Understanding Routing & Request Life Cycle
- Layouts
- Bundle
- Minification
- MVC Security
- Entity Framework
- Understanding ASP.Net MVC Core
- Windows Communication Foundation
- Web APIs

General Aptitude & Effective Communications - 80 Hours

- **Aptitude:**
    - Percentage
    - Profit & Loss
    - Ratio & Proportion
    - Average
    - Mixture & Allegation
    - Simple Interest & Compound Interest
    - Number Systems
    - Series
    - Cyclicity & Remainders
    - Data Interpretation

- Syllogism
- Coding & Decoding
- Blood Relations
- Seating Arrangements (Linear & Circular)
- Ages
- Puzzles
- Time
- Speed & Distance
- Trains
- Boats & Streams
- Time & Work
- Wages (Man days)
- Pipes & Cisterns
- Clocks
- Permutations & Combinations
- Probability
- Calendar
- **Effective Communication:**
  - Fundamentals of Communication
  - The Art of Communication
  - Personality Development
  - English Grammar
  - Correct Usage of English
  - Listening Skills
  - Reading Skills
  - Writing Skills
  - Presentation Skills
  - Group Discussions
  - Personal Interviews

Project - 120 Hours

In addition to the specific subject knowledge, the Software Project module attempts to put into practice a number of things that the students have learned during the PG-DAC course, such as:

- Ability to work in a team
- Software development methodology and principles
- Good programming practices
- Technical reporting and presentation

The Software Project module is divided in three phases: I – SRS Phase: Tasks: Requirements gathering, feasibility study and project thinking. II – Design Phase: Tasks: Software design and project plan. III – Development Phase: Tasks: Coding and testing of the software system/application.