



## **Core JAVA Modules:-**

### Part 1 - Introduction to Java and Java Architecture

- Understanding OO approach
- OO programming and procedural programming
- What is object?
  - State
  - Identity
  - Responsibility
- 4+1 major pillars and 3 minor pillars of object oriented programming.
  - Abstraction
  - Encapsulation
  - Inheritance
  - Polymorphism
    - Static
    - Dynamic
    - Modularity
  - Strong type casting
  - Persistence
  - Concurrency
- How Java fits in OO programming?
- History of Java
- Features of Java
- Java Architecture
  - Java compiler
  - Class loader
  - Bytecode verifier
  - JVM

### Part 2 – Data types and Variables

- Java primitive data types
- Classification of data types
- Declare java classes
- Use Primitives, Arrays, Enums& Legal Identifiers
- Access control mechanism

### Part 3 – Operators

- Relational operators

- Arithmetic operators
- Conditional operators
- Logical operators

#### Part 4 – Statement Control

- Loops
  - Basic loops
  - Advance loops
- Conditional statements
- Switch statements
- Continue & break
- Compound statements

#### Part 5 – Arrays

- Creating, Initializing, and Accessing an Array
- Passing & copying Arrays

#### Part 6 – Abstract classes and methods

- Abstract classes
- Abstract methods
- When & where to use abstract classes

#### Part 7 – Packages and Interfaces

- Access control mechanism
- Interfaces in Java
- Why & when to use interfaces?
- What is programming by contract?

#### Part 8 – Collections

- Purpose of collections
- Collection hierarchy
- Classes under List and there usage
- Classes under Set and there usage
- Classes under Map and there usage

#### Part 9 – Exception Handling

- Need of exception handling
- Exception hierarchy in Java
- Try, Catch & finally constructs
- Cascading exceptions
- Distinguish between throw & throws keywords
- User defined exceptions

#### Part 10 – Threads

- What is a thread? What is the advantage of using thread?
- Life cycle of thread
- How OS and JVM handle threads?

- Implementing threads in Java

#### Part 11 – JAVA Multithreading

- Implementing multithreading in java
- Pros & cons of multithreading
- Synchronization
- Utility methods

#### Part 12 – I/O Streams

- Purpose of I/O
- Understanding streams
- Describing I/O hierarchy
- Understanding need of buffer streams
- Reader & Writer classes

#### Part 13 – Basics of Networking

- Purpose of networking
- Understanding socket programming
- Implementing one-way and two-way communication

#### Part 14 – Database connectivity with JDBC/ODBC

- JDBC API
- 4 type of drivers
- Important classes & interfaces
- Executing queries and procedures
- Batch programming
- Handling transactions

#### Part 15 – AWT and Swing

- Identifying need of AWT
- Understand the hierarchy of classes in AWT
- Write AWT class
- Understanding Component & Container classes
- Writing code for AWT classes with components
- Using call back methods
- Swing component hierarchy
- Swing programming
- Event handling

#### Part 16 – Applets

- Defining an Applet
- Life Cycle of an Applet
- Restriction on applets
- Parameter passing in applets
- Applet container & applet context
- Inter applet communication

## Part 17 – JAVA Reflection API

- Uses of Reflection
- When & where to use reflection
- Drawbacks of Reflection

## Part 18 – Advanced Concepts

- Reusable Software Components
- Abstraction
- Inheritance
- Polymorphism
- Iterators
- Auto-Boxing