

# Core Java

## Course Highlights :

### Basics of Java

- What is Java?
- History and Features of Java
- C++ vs Java
- Hello Java Program
- Internal How to set the path?
- JDK, JRE, and JVM (Java Virtual Machine)
- JVM Memory Management
- Internal details of JVM
- Unicode System, Operators, Keywords, and Control Statements like if-else, switch, For loop, while loop, etc.

### Class, Object, and Types of classes

- Naming convention of Java
- Classes, Objects, and Features. It explains how to declare a class, how to create an object in Java.
- Object declaration and initialization
- Life cycle of an object

### Data types in Java

- Data types in Java
- Primitive data types

- Non-primitive data types
- Memory allocation of primitive and non-primitive data types, etc.
- Type Conversion
- Auto-Boxing and Unboxing

### **Variables, Constants, and Literals**

- Variable declaration & initialization
- Naming convention
- Types of variables such as local variables, instance variables, and static variables
- Scope and memory allocation of variables.
- Command line argument

### **Methods in Java**

- Methods in Java
- Use of method in Java
- Method declaration, method signature
- Types of methods in Java: predefined method, user-defined methods: instance method, static method
- Calling of method
- Java main method
- Return type in Java.

### **Constructor in Java**

- What is Constructor in Java?
- Types of constructors: Default and Parameterized constructors
- Java constructor overloading
- Constructor chaining in java
- Copy constructor in Java

## Modifiers in Java

- What is Access modifier and Non-access modifier in Java
- Types of access modifiers like private, default, protected, and public
- Types of Non-access modifiers like abstract, final, native, static, synchronized modifier, transient, volatile.

## Static Keyword

- What is Static keyword?
- Static variable
- Static method
- Static block, Instance block
- Static Nested Class in Java
- Difference between static variable and instance variable, static method and instance method, static block, and instance block.
- Static import

## Final Keyword

- Final keyword
- Final variable
- Final method
- Final class.

## Inner Class in Java

- Definition of Inner class in Java, Properties of inner class, Instantiating inner class.
- Types of inner class in Java: Normal inner class, Method local inner class, Anonymous inner class, and Static nested class.

## Super and this Keyword

- Super keyword
- Calling of superclass instance variable

- Superclass constructor
- Superclass method.
- This keyword
- Calling of current class constructor, and method.

## **OOPs concepts**

OOPs concepts comprises of class, object, encapsulation, inheritance, polymorphism, and abstraction

## **Encapsulation**

- Encapsulation in Java
- How to achieve Encapsulation
- Data hiding
- Tightly encapsulated class
- Getter and setter method in Java
- Naming convention of getter and setter method

## **Inheritance**

- Inheritance in Java
- Is-A Relationship
- Aggregation and Composition (HAS-A)
- Types of inheritance: Single level, Multilevel, Hierarchical, Multiple, and Hybrid inheritance.

## **Polymorphism**

- Polymorphism in Java,
- Types of polymorphism: Compile-time polymorphism and Run-time polymorphism
- Static and Dynamic Binding
- Method overloading

- Method overriding
- Rules of method overloading and method overriding, various example programs related to rules of overloading and overriding.
- Covariant Return type

### **Abstraction**

- Abstraction in Java
- Abstract class
- Abstract method
- Interface in Java
- Nested interface, rules, and example programs.

### **Garbage Collection**

### **Input and output**

- FileOutputStream, FileInputStream
- BufferedOutputStream, BufferedInputStream
- SequenceInputStream
- ByteArrayOutputStream, ByteArrayInputStream
- DataOutputStream, DataInputStream
- Java FilterOutputStream, Java FilterInputStream
- Java ObjectStream, Java ObjectStreamField
- Console
- FilePermissionWriter, Reader, FileWriter, FileReader
- BufferedWriter, BufferedReader
- PrintStream, PrintWriter
- OutputStreamWriter, InputStreamReader
- StringWriter, StringReader

- FilterWriter, FilterReader, File FileDescriptor, RandomAccessFile, and java.util.Scanner.

## **Packages in Java**

- How to declare package in a company project
- Package naming conventions
- Sub packages
- Types of packages such as user-defined packages, built-in packages
- Importing packages in Java

## **Collections Framework**

- What is Collections Framework?
- List, Set, SortedSet, Queue, Deque, Map, Iterator, ListIterator, and Enumeration.
- ArrayList, LinkedList, HashSet, LinkedHashSet, TreeSet, ArrayDeque, PriorityDeque, EnumSet, AbstractCollection, AbstractList, AbstractQueue, AbstractSet, and AbstractSequentialList.
- Map, Map Entry, SortedMap, and NavigableMap
- HashMap, LinkedHashMap, TreeMap, IdentityHashMap, WeakHashMap, and EnumMap.
- Comparator, RandomAccess interfaces as well as Observable class.
- Wrapper Class

## **Serialization**

- Serialization, Deserialization, and Java transient keyword.

## **Exception Handling in Java**

- Exception Handling in Java
- Try-catch block
- Multiple Catch Block
- Nested try block

- Finally block
- Throw Keyword
- Throws Keyword
- Throw vs Throws, Final vs Finally vs Finalize
- Exception Handling with Method Overriding Java Custom Exceptions

### **Java Annotations**

Built-In Java annotations like `@Override`, `@SuppressWarnings`, `@Deprecated`, `@Target`, `@Retention`, `@Inherited`, `@Documented`, Java custom annotations, and types of annotations.

### **Reflection in Java**

- New Instance() & Determining the class object
- Creating applet viewer
- Accessing private method from outside the class

### **Java Array**

- This chapter deals with
- Java Array
- Types of array: single dimensional array, multidimensional array, declaration, instantiation, and initialization of Java array
- Jagged Array
- Passing array to a method
- Cloning an array in Java

### **String, String Buffer, String Builder**

- String, String Functions
- Immutable String
- String Comparison, String concatenation
- Substring

- StringBuffer class
- StringBuilder class
- toString method
- StringTokenizer class

## Java Thread

- Java multithreading
- Multithreading life cycle of a thread creating
- Thread scheduler
- Sleeping a thread, Start a thread twice
- Calling run() method
- Joining a thread
- Naming a thread
- Thread priority,
- Daemon thread
- Thread pool
- Thread group
- Shutdownhook
- Java Synchronization: synchronized method, synchronized block, static synchronization
- Deadlock
- Inter-thread Communication
- Interrupting Thread

## GUI Programming

- Designing Graphical User Interfaces in Java,



- Components and Containers
- Introduction to Applet
- Applet class hierarchy
- Applet Life cycle
- How to run applet using HTML and applet viewer tools
- Layout Managers
- AWT Components
- Extending GUI Features Using Swing Components
- Event Handling

### **Event-Driven Programming in Java**

- Event- Handling Process
- Event Handling Mechanism

### **Project**

### **Exit Profile : Java Coder**

Certificate & Placement assistance will be provided after completion of the course & clearing exams.

### **Course Objective :**

Core Java certification course is designed by experienced professionals to match the current industry requirements and demands. You will learn the importance of Java in real time environment and will be able to develop applications based on the Core Java Programming concept.