

# Core and Advanced Java Syllabus

## 1. The History And Evolution Of Java

- The Birth Of Modern Programming :C
- The Creation Of Java
- How Java Changed The Internet
- The Java Buzzwords
- The Evolution Of Java
- A Culture Of Innovation

## 2. JVM Architecture

- JDK, JRE, JVM, JIT
- Environment setup

## 3. Java Basics

- Datatypes
- Primitive datatypes
- byte, short, char, int, long, float, double
- Object datatypes
- Built-in datatypes
- String, Arrays, etc
- User-defined datatypes
- Class, Interface, Enum
- Variables
- Static / Class level, Instance, Local & Method arguments
- Access Modifiers & Non-Access Modifiers
- Operators
- Arithmetic Operators
- The Bitwise Operators
- Relational Operators
- Boolean Logical Operators
- The Assignment Operator
- Ternary Operator
- Control flow statements
- If, if else, if else if ladder, switch, while, do while
- Translation of a Java Program
- Methods
- Static methods
- Non-static methods
- Main method
- Java First Program
- Using Command-Line Arguments

## 4. Introducing Classes

- Class Fundamentals

- Declaring Objects
- Constructors
- Default, No-argument and Parametrized
- Garbage Collection
- The Finalize() Method

## **5. String Handling**

- The String Constructors
- The String Length
- Special String Operations
- Character Extraction
- String Comparison
- Searching Strings
- Modifying A String
- Data Conversion Using String.valueOf()
- Additional String Methods
- String Buffer
- String Builder
- String.format()

## **6. Object Oriented Programming**

- Uses of this keyword and this() statement
- Overloading Methods
- Varargs : Variable-Length Arguments
- Using Objects As Parameters
- A Closer Look At Argument Passing
- Returning Objects
- Recursion
- Introducing Final

## **7. Inheritance**

- Inheritance Basics
- Using super keyword and super() statement
- Creating A Multilevel Hierarchy
- Method Overriding
- Using Abstract Classes
- Using Final With Inheritance
- The Object Class

## **8. Packages And Interfaces**

- Packages
- Access Protection
- Importing Packages
- Interfaces

## **9. Exception Handling**

- Exception Handling Fundamentals
- Exception Types

- Uncaught Exceptions
- Java Built-In Exceptions
- Creating Your Own Exception Subclasses
- Java 7 enhancements in exceptions

#### **10. Multithreaded Programming**

- The Java Thread Model
- The Main Thread
- Creating Thread
- Synchronization
- Inter Thread Communication
- Suspending , Resuming , and Stopping Threads
- Multitasking

#### **11. Boxing , Autoboxing , And Annotations(Metadata)**

- Enumerations
- Type Wrappers
- Autoboxing
- Annotations(Metadata)
- I/O
- I/O Basics
- Reading Console Input
- Writing Console Input
- The Print Writer Class
- File handling with byte oriented streams
- File handling with character oriented streams

#### **12. Collection API**

- List Stream
- Developing our own ArrayList
- Developing LinkedList(single,double,circular)
- Developing Stack and Heap
- Collections class
- Set stream-basics
- Set uniqueness
- TreeSet , NavigableSet
- Queue stream-Basics
- Priority Queue
- Map stream-Basics
- Uniqueness in Map
- HashMap & HashTable
- Developing our own ThreadLocale
- TreeMap & Navigable Map

#### **13. Generics**

- What Are Generics?

- A Simple Generics Example
- A Generics Class With Two Type Parameters
- The General Form Of A Generics Class
- Creating A Generic Method
- Generic Interface
- Raw Types And Legacy Code

#### **14. NetWorking**

- Networking Basics
- The Networking Classes And Interfaces
- InetAddress
- Tcp / Ip Client Sockets
- Url
- Url Connection
- Http Urlconnection
- The Url Class
- Cookies
- Tcp / Ip Sockets
- Datagrams

#### **15. Event Handling**

- Two Event Handling Mechanisms
- The Delegation Event Model
- Event Classes
- Source Of Events
- Event Listener Interfaces
- Using The Delegation Event Model
- Adapter Classes , Inner Classes

#### **16. Java Tools**

- Debug a Java Program
- Export Java Programs
- Generate Java Documentation

#### **15. Manage libraries through Maven**

- What is Maven
- Uses of Maven
- Manage repositories and libraries
- Maven build life cycle

#### **16. Junit framework**

- What is Junit
- About @Before, @After, @Test
- How to write test cases
- Various types of assertions
- How to assert exceptions

#### **17. Logging framework**

- Benefits of Logging framework over Console O/P

- Available logging frameworks
- Log4j Vs Slf4j
- Levels of logging
- Manage Logger configuration through log4j.xml / logback.xml