

Core Java Training Syllabus

Module 1: Introduction (Duration-0.5hr)

- Java Why? What? How? When? Where?
- Different Java Versions.
- How Java is different from other Technologies

Module 2: Introduction To Java Programming Environment (Duration-1hr)

- How to Install & Set Path.
- A Simple Java Program
- Compiling & executing Java Program
- Phases of Java Program
- Analysis of a Java Program
- Understanding Syntax and Semantic Error,
- Runtime Exception
- Name of a Java Source File
- Platform Independency
- Java Technology (JDK, JRE, JVM, JIT)
- Features of Java

- Text Editors

- Consoles

Module 3: Fundamentals of Java Programming (Duration-1hr)

- The naming convention of Java language
- Comments
- Statements
- Blocks (Static, Non-static/instance)
- Identifiers
- Keywords
- Literals
- Primitive Data Types, Range
- Reference (User-defined) Data type
- Variables (Primitive, Reference)
- Type Casting, Default Value
- Operators
- Program/Interview questions

Module 4: Control Structures (Duration-1hr)

- Working with Control Structures
- Types of Control Structures
- Decision Control Structure (if, if-else, if-else if, switch case)
- Repetition Control Structure (do-while, while, for)
- Program/Interview questions

Module 5: Input Fundamentals And Datatypes In Java (Duration-2hrs)

- Java program inputs from Keyboard
- Methods of Keyboard inputs
- Scanner, Buffered Reader
- Problem Solving
- Java Array
- What is Array
- Array Declaration in java vs C and C++.
- Instantiation of an Array
- String vs character array. Accessing Array
- Elements, Default Value, for-each loop, varargs
- Length of an Array (What is Array Index Out Of Bounds Exception)

- Increasing, Decreasing the Size and Copy of an Array
- Multi-Dimensional Arrays
- Program/Interview questions
- Program/Interview questions Difference between C and C++ with Java
- Application Compilation and Run
- Interview related Question and Answer

Module 6: Object-Oriented Programming (Oops Concepts In Deep) (Duration-4hrs)

- Procedural Vs Object-Oriented Program
- Different types of Program Procedural Vs Object Oriented.
- Top-Down Vs Bottom-Up Approach
- Introduction to Object-Oriented
- Abstraction, Encapsulation, Inheritance,
- Polymorphism.
- Introduction to Classes and Objects
- Custom Class Definition
- Instance and Static Variables
- Different ways to create Object Instance

- Instance Variable and its role in a Class
- Constructors, types of Constructor,
- Constructor Rule, Constructor Overloading
- Static Variable and its use.
- Methods and their behavior.
- Constructor vs Methods
- Constructors
- `this` Keyword
- Java Access Modifiers (and Specifiers)
- Programming Interview related Question and Answer
- Call by value, Call by reference

Module 7: Command-Line Arguments (Duration-1hr)

- What is a Command-Line Argument?
- Java Application with Command-Line Arguments
- Conversion of Command-Line Arguments
- Parsing Command-Line Arguments
- Using methods (Static, Non-Static)

Module 8: Integrated Development Environment (Duration-0.5hr)

- Using various Editors
- Program Compilation, Execution in Editor
- Using Eclipse IDE
- Project Set-Up
- Source File Generation
- Application Compilation and Run

Module 9: Inner Class (Duration-1hr)

- First View of Inner Class
- Outer Class Access
- Types of Inner Class

Module 10: Inheritance (Duration-2hrs)

- Complete concepts of Inheritance
- Sub-Classes
- Object Classes
- Constructor Calling Chain
- The use of super Keyword

- The use of private keyword inheritance.
- Reference Casting

Module 11: Abstract Classes and Inheritance (Duration-2hrs)

- Introduction to Abstract Methods
- Abstract Classes and Interface
- Interface as a Type
- Interface v/s Abstract Class
- Interface Definition
- Interface Implementation
- Multiple Interfaces Implementation
- Interfaces Inheritance
- How to create object of Interface

Module 12: Polymorphism (Duration-2hr)

- Introduction to Polymorphism
- Types of Polymorphism
- Overloading Methods
- Overriding Methods

- Hiding Methods
- Final Class and Method
- Polymorphic Behavior in Java
- Benefits of Polymorphism
- Is - A vs Has - A
- Association Vs Aggregation
- Interview related Question and Answer.

Module 13: Package (Duration-2hrs)

- Package and Classpath and its use
- First look into Packages
- Benefits of Packages
- Package Creation and Use
- First, look into Classpath
- Classpath Setting
- Class Import
- Package Import
- Role of public, protected, default and private w.r.t package

- Namespace Management
- Package vs. Header File
- Creating and Using the Sub Package
- Sources and Class Files Management

Module 14: Using Predefined Package & Other Classes (Duration-2hrs)

- Java.lang Hierarchy
- Object class and using toString(), equals(), hashCode(), clone(), finalize() etc
- Using Runtime Class, Process Class to play music, video from Java Program
- Primitives and Wrapper Class
- Math Class
- String, StringBuffer, StringBuilder Class
- String Constant Pool
- Various usage and methods of String, StringBuffer, StringBuilder
- Wrapper Classes
- System Class using gc(), exit(), etc.

Module 15: New Concepts In Package (Duration-2hr)

- Autoboxing and Auto unboxing

- Static import.
- An instance of the operator.
- Enum and its use in Java
- Working with jar

Module 16: Garbage Collection (Duration-0.5hr)

- Garbage Collection Introduction
- Advantages of Garbage Collection
- Garbage Collection Procedure
- Java API
- Interview related Question and Answer

Module 17: Exception Handling (Duration-2hrs)

- Introduction to Exceptions
- Effects of Exceptions
- Exception Handling Mechanism
- Try, catch, finally blocks
- Rules of Exception Handling
- Exception class Hierarchy, Checked &

- Unchecked Exception
- Throw & throws keyword
- Custom Exception Class
- Chained Exception.
- Resource handling & multiple exception class
- Interview related Question and Answer.

Module 18: Multithreading (Duration-3hrs)

- Introduction
- Advantages
- Creating a Thread by inheriting from Thread class
- Run() and start() method.
- The constructor of Thread Class
- Various Method of Thread Class
- Runnable Interface Implementation
- Thread Group
- The Thread States and Priorities
- Synchronization method, block

- Class & Object Level Lock
- Deadlock & its Prevention
- Inter thread Synchronization
- Life Cycle of Thread
- Deprecated methods : stop(), suspend(),resume(), etc
- Interview related Question and Answer

Module 19: Input and Output Streams (Duration-3hrs)

- Java I/O Stream
- `java.io` Stream Introduction
- Types of Streams
- Stream Class Hierarchy
- Using File Class
- Copy and Paste the content of a file
- Byte Streams vs Character Streams
- Text File vs Binary File
- Character Reading from Keyboard by Input Stream Reader
- Reading a Line/String from Keyboard by Buffered Reader

- Standard I/O Streams Using Data Streams to read/write
- primitive data
- PrintStream vs PrintWriter Using StreamTokenizer and RandomAccessFile
- Interview related Question and Answer

Module 20: Serialization (Duration-0.5hr)

- Introduction to Serialization
- Using Object Streams to read/write object
- Transient Keyword
- Serialization Process
- Deserialization Process
- Interview related Question and Answer

Module 21: Collection Framework (Duration-3hrs)

- Generics(Templates)
- What is generic
- Creating User defined Generic classes
- The java.util package
- Collection

- What is Collection Framework
- List, Set & Map interfaces
- Using Vector, Array List, Stack,
- Linked List, etc.
- Using Collections class for sorting
- Using Hashtable, Hash Map, Tree Map,
- SortedMap, LinkedHashMap etc.
- Iterator, Enumerator.
- Using Queue, Deque, SortedQueue, etc.
- Using HashSet, TreeSet, LinkedHashSet etc
- Using Random class
- Using Properties in a Java Program
- Using user-defined class for DataStructure
- Using Date and Formatting Date class.
- Interview related Question and Answer

Module 22: Java 8/9/10 Features (Duration-1hr)