

Course Title: Core Java

Duration: 24 hours

Module 1 - Introduction to OOPs & Java

- Difference between OOP and other conventional programming – advantages and disadvantages.
- Class, object, message passing, inheritance, encapsulation, polymorphism

Module 2 - Basic Programming Components

- Java byte-code & JVM, data types, access specifiers, operators, control statements & loops, array, switch etc.
- Static variables & methods

Module 3 - OOPs Concept in Java (Classes, Objects)

- Creation of class, object, constructor, finalize and garbage collection.
- Method overloading, this keyword, use of objects as parameter & methods returning objects, call by value & call by reference

Module 4 - Reusability properties

- Inheritance - Super class & subclasses including multilevel hierarchy, process of constructor calling in inheritance, use of super and final keywords with super() method.
- Polymorphism - Dynamic method dispatch, method overriding, use of abstract classes & methods, interfaces.
- Packages - Creation of packages, importing packages, member access for packages.

Module 5 - Language features to be covered

- Inner & nested Classes, Anonymous Classes, Abstract Classes, Final Classes
- Wrapper Classes, Autoboxing.
- Basic String handling concepts - (discuss charAt(), compareTo(), equals(), equalsIgnoreCase(), indexOf(), length(), substring(), toCharArray(), toLowerCase(), toString(), toUpperCase(), trim(), valueOf() & StringBuffer classes (discuss append(), capacity(), charAt(), delete(), deleteCharAt(), ensureCapacity(), getChars(), indexOf(), insert(), length(), setCharAt(), setLength(), substring(), toString() methods)
- Concept of mutable and immutable string, command line arguments.

Module 6 - Exception Handling

- Exception handling basics, different types of exception classes, use of try & catch with throw, throws & finally, creation of user defined exception classes.
- Revisit concept of method overloading and overriding in the context of exception.

Module 6 - Multithreading In Java

- Basics of multithreading, main thread, thread life cycle, creation of multiple threads, thread priorities, thread synchronization.
- Interthread communication, deadlocks for threads, suspending & resuming threads.

Module 7 - IO Streams & File Handling In Java

- Basics of I/O operations – keyboard input using BufferedReader & Scanner classes
- File operations
- Read and write locks

Module 8 - Applet Programming

- Basics of applet programming, applet life cycle, difference between application & applet programming, parameter passing in applets, concept of delegation event model and listener, I/O in applets, use of repaint(), getDocumentBase(), getCodeBase() methods, layout manager (basic concept), creation of buttons (JButton class only) & text fields

Module 9 - Collections

- What are collections and where they are needed
- Arrays, Lists, Hash-maps, Directories
- Iterators

Module 10 - Java 8 feature