**Syllabus : JAVA**

Duration : 60 hrs (Each Session 1 hour )

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| **Session 1** |
| * Why You Should Learn Programming Language * How You Should Learn Programming Language * Different Types of Software * Different Types of Programming Paradigms * What is Java? * History of Java * Features of Java |
| **Session 2** |
| * How to write Java Program * Compiling and Executing java program * Phases of java program * Analysis of main() method * What is JDK, JRE, JVM, JIT |
| **Session 3-6** |
| * What is a Command-Line Argument? * Java Application with Command-Line Arguments * Conversion of Command-Line Arguments * Identifiers * Instance Variable, Reference Variable, Static Variable * Static block, Non Static block * Datatypes * Operators * Conditional Statements * Loops * Array |
| **Session 7** |
| * Procedural Vs Object Oriented Program * Different type of Program Procedural Vs Object Oriented. * Top Down Vs Bottom Up Approach * Introduction to Object Oriented * Abstraction, Encapsulation, Inheritance, * Polymorphism |
| **Session 8 -10** |
| * Introduction to Classes and Objects * Custom Class Definition * Instance and Static Variables * Instance Variable and it’s role in a Class * Constructors, types of Constructor, * Constructor Rule, Constructor Overloading * Static Variable and it’s use. * Methods(Static & Non static) and their behaviour. * Using blocks (Static, Non Static) * Constructor vs Methods * “this” Keyword * Java Access Modifiers (and Specifiers) * Call by value, Call by reference * Different ways to create Object Instance |
| **Session 11** |
| * First View of Inner Class * Outer Class Access * Types of Inner Class |
| **Session 12** |
| * Complete concepts of Inheritance * Sub-Classes * Object Classes * Constructor Calling Chain * The use of “super” Keyword * The use of “private” keyword inheritance. * Reference Casting |
| **Session 13 & 14** |
| * 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 |
| **Session 15 & 16** |
| * Introduction to Polymorphism * Types of Polymorphism * Polymorphic Behavior in Java * Benefits of Polymorphism * Overloading Methods * Covariant return type in Overriding Methods * Hiding Methods * Final Class and Method * “Is-A” vs “Has-A” * Association Vs Aggregation |
| **Session 17-19** |
| * Package and Class path and its use * First look into Packages * Benefits of Packages * Package Creation and Use * First look into Class path * Class path 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 * 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 * Wrapper Classes * System Class using gc(), exit(), etc. |
| **Session 20** |
| * String, StringBuffer, StringBuilder Class * String Constant Pool * Various usage and methods of String,StringBuffer, StringBuilder |
| **Session 21-23** |
| * 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 |
| **Session 24 - 26** |
| * Introduction to Multithreading * Creating a Thread by inheriting from Thread class * Run() and start() method. * Life Cycle of Thread * Constructor of Thread Class * Various Method of Thread Class * Runnable Interface Implementation * Thread Group * Thread States and Priorities) * Synchronization method, block * Class & Object Level Lock * Deadlock & its Prevention * Inter thread Synchronization |
| **Session 27-29** |
| * I/O Stream – Introduction * Types of Streams * Stream Class Hierarchy * Using File Class * FileInputStream * FileOutputStream * FileReader * FileWriter * BufferedReader * Transient Keyword * Serialization Process * Deserialization Process * Assignments |
| **Session 30** |
| * Introduction to Java Network Programming, * Using InetAddress,Socket, and ServerSocket * Using suitable data streams & data transfer * Creating Socket Application Using TCP/IP |
| **Session 31-35** |
| * What is Collection Framework * Legacy and non-legacy collection classes * List, Set & Map interfaces * Using Vector, Array List, Stack, * Using Collections class for sorting * Linked List. * Using HashSet, TreeSet, LinkedHashSet etc * Using Hashtable, Hash Map, Tree Map, * Iterator, Enumerator. * SortedMap, LinkedHashMap etc. * Using Queue, Deque, SortedQue, etc. * Using Random class * Using user defined class for DataStructure * Using Date and Formatting Date class. * Using Properties in a Java Program * Reflection Overview,Annotation Overview |
| **Session 36 – 39** |
| * SQL Basics * Creating table * CURD Operation * What is JDBC, Driver architecture * Using Driver Manager, Connection, Statement * Using ResultSet to fetch data * Using ResultSet for CURD Operation * Scrolling and Updatable constants. * How to create Scrollable and Updatable Result Set * Prepared Statement to manipulate DB * Creating function and Stored procedure * Connecting with different Database * Using Callable Statement * Handling BLOB to store & retrieve binary content |
| **Session 40 - 43** |
| * What is Applet, creating an Applet * Life cycle of an Applet * Using Applet viewer * How to create a Frame * AWT Hierarchy * Button, Text Component, Label, etc * Checkbox, Radio button, Choice, List * Layout Managers * Using Audio, Video, Image in Applet * What is Event * Event handling mechanism * Handling different Event * Adapter class * Using Lambda expression for event handling * Using Swing |
| **Session – 43 – 53** |
| * Live Project |