Core Java Online Training Content

1. **Introduction to Java**

- Evolutions of Programming languages and History of Java
- Features of Java
- Understand Java platform and environment(Java Compilers, VM and API)
- Installation of Java and Path settings

2. **Language Fundamentals**

- Basic structure of Java program
- IDEs and example of IDEs like eclipse and NetBeans
- Explanation of Basic OOPs concepts like Class and Object
- Datatypes, Variables ,Literals and default values
- Identifiers and Keywords

3. **Operators and Assignments**

- Assignment operators
- Arithmetic operators
- Relational operators
- Logical operators
- Misc operators (Conditional operator and Instance of Operator)
- Operator precedence.

4. **Loop Control and Decision making**

- While, do…while , for loop
- If, If…else, If…else… if…else
- Break and Continue keywords
- Switch statement

Programming sessions

- HellowWorld Example

- Creating BankAccount,Employee Class and Objects
- Calculating Factorial of Number
- Calculating Fibonacci series
- Student Result program
- Practice program for using break and continue statements
- Quiz

5. **Object oriented programming**

- Class and Object: define class, creating objects and member access
- Constructors :default, parametrized and overloading of constructors
- Methods: creating and accessing of methods, return types and overloading of methods
- Method Pass by value and Pass by reference
- Inheritance : extends keyword, inheritance hierarchy
- Super keyword: Constructors, methods and variables.
- Type Casting of Object
- Overriding: Overriding of methods ,dynamic method lookup
- Overloading Vs Overriding
- Abstract classes and Interfaces
- Has-A and Is-A relationship
- Modifiers : Static, Final and Abstract
- Packages in Java
- Access specifies: Public, Protected, default and Private.
- Overriding w.r.t access specifies.
- Garbage Collector and Finalize keyword

Programming sessions

- Create BankAccount class and apply all oops principles mentioned above.
- Create Employ class and apply all oops principles mentioned above.
- Example to explain Has-A and IS-A relationship using BankAccount and Customer class
- Design class for given specification
- Quiz

6. **Arrays and Strings**

- Declaring, Creating and Initializing Arrays.

- Primitive data type Arrays and User Defined data type Arrays
- Single Dimension Arrays and Double Dimension Arrays
- Reading and Writing to Arrays using For loop and For each loop
- Passing Arrays to and Returning Arrays from methods.
- Different ways of Creating Strings
- String Length and Concatenating String
- String Formatting
- Explanation of Commonly Used String methods.
- StringBuffer and StringBuilder
- Difference between String and StringBuffer

Programming Sessions

- Program for Sorting of Array
- Program for Searching of element inside Array
- Program to explain storing and retrieval of Objects in Array
- Program to explain ArrayIndexOutofBound exception
- Program to explain String object creation in String Pool
- Program to explain splitting of String based on special character
- Program to explain creating substrings
- Program to Revers String
- Program to explain Usage of StringBuffer and StringBuilder
- Quiz

7. Fundamental Classes

- Object class
- Overview of java. lang package
- Wrapper classes
- Math class
- System class
- Date and Calendar class

Programming session

- Program to Display Current date and time
- Program to explain adding of days, months, years to Current Date.

- Program to explain different formats of Date.
- Program to explain different functions of Math class
- Program to explain different functions of System class
- Quiz

8. **Exception Handling**

- Understand Exception handling mechanism
- Difference between error and exception?
- Why Exception handling is important?
- Usage of Try, Catch, Finally, Throws and Throw in exception handling mechanism.
- Understand different types of Exception (Checked Exception and Unchecked Exception)
- How to write CustomException class and need for it?
- Rules on overriding of methods

Programming session:

- Program to explain abnormal situations in execution
- Handling of different exceptions using try, catch and finally.
- Example to explain propagation of Exceptions using throws clause.
- Example to explain Throw usage
- Writing Custom Exceptions
- Printing stack trace to console
- Quiz

9. **Threads**

- What is Process and Thread?
- Why use Threads?
- Creating Thread using Thread class and Runnable interface.
- Thread life cycle
- Thread control methods : Start(),Sleep(),Join(),Yield();
- Thread scheduler and priority
- Thread synchronization: Synchronize, wait(),notify(),notifyAll()

Programming session:

- Program to identify name of Running Thread
- Program to know status of Threads
- Creation of NubmerThread and CharacterThreads to explain Thread creation methods and control methods.
- BankingApplication to explain Thread synchronization
- Quiz

10. **Collection framework**

- Understand Collection Framework
- List :ArrayList,LinkedList and Vector
- Implementing equals and Hashcode method
- Set :HashSet ,LinkedHashSet and TreeSet
- Maps: HashMap,LinkedHashMap ,TreeMap and HashTable
- Stack and Queues
- Usage of Comparator and Comparable
- Collections class
- Generics

Programming session:

- Print sum of numbers in ArrayList
- Get first and last element of LinkedList
- Usage of different types of Collection like List,Set and Maps
- Removing specific elements from Collection
- Sorting Employee objects in List based on Name using Comparable and Comparator.
- Usage of Generics
- Quiz

11. **Files and I/O**

- Console I/O
- Byte streams
- Character streams
- Reading and Writing files
- I/O wrapper classes
- Serialization

Programming session:

- Reading data from File
- Writing data to File
- Usage of I/O wrapper classes to read or write data from file
- List our all files inside directory
- Serialization and deserialization of Employee class.
- Quiz

12. **JDBC**

- Overview of JDBC technology
- JDBC drivers
- Basic steps in Using JDBC
- Using Statement, PreparedStatement and CallableStatement.
- Retrieving Data from ResultSet
- Handling SQL exceptions
- Submitting multiple statements as a transaction
- Good JDBC programming practices

Programming session:

- Create, Edit and Alter table using Java
- Update, Edit and Delete rows in table
- Execute batch of SQL statements
- Usage of Statement, PreparedStatment and CallableStatement
- Display Employee table data
- Combine data of more than one table
- Commit and Rollback examples
- Quiz

13. **Project using Core Java and JDBC.**