Brainware Computer Academy

Object Oriented Programming using Core Java

(Specially Designed for WBCHSE, CBSE, ICSE & ISC)

Duration : 22 Sessions / 44 Hours / 8 Weeks

Class logistics: 3 Sessions (6 Classes) a week.
(6 Hours each week. A "Session" compris es of 1 theory class & 1 practical class of 1 hour each)

Session-wise Syllabus:

Session 1: Introduction to Java Technology
Brief history of Java
Java Development Kit (JDK)
Java Compiler
Java Interpreter
Source Code & Byte code with "Hello World" Appli cation

Session 2: Java: data types, variables, expressions
Basic Data Types
- Integers - example, size in bytes
- Characters - example, size in bytes
- Floating Points - example, size in bytes
- Boolean - example, size in bytes

Variables
- Declaration of variable
- Assignment Statements
- Scope and life time of a variable

Expressions
A simple java program illustrating variables

Session 3: Java Escape Characters, Keywords & Arithmetic Operators
Special characters
- \n, \t, \\

Output using system.out.print and sys tem.out.println
Comments
- /* */
- //

Separators
Keywords
Arithmetic Operators : + - * / % ++ —
A simple Java program illustrating operators
Operator precedence
A simple Java program illustrating operator precedence

Session 4:Boolean Operators and Selection Statements
Control statement
If Statement
Relational Integer operators: > < >= <= == !=
Logical operators: && || !
Simple Java programs illustrating relational operators

Session 5: Control statement revised
- if. else
- switch..case..default

Simple Java programs illustrating if..elseif
Simple Java programs illustrating switch..case
Conditional boolean operator (? :)

Session 6: Iteration Statements
Loops
- for
- while
- do..while

Program illustrating for, while and do..while loop

Session 7: Iterative Statements Continued…
Nested loop
Program illustrating nested for loop
Jump statements
- break;
- continue;

Session 8: Introducing Classes and Methods
Class and object fundamentals
Declaring classes
Declaring object
The "new" operator
A Java program to show class declaration and class object creation
Introducing class variables
A Java program using class variables
Introducing methods
- Adding method to a class
- Adding a method that takes parameters
- Method returning value

A Java program using class methods with no parameter
A Java program using class methods with parameter and return value

Session 9: A Closer Look at Methods and Classes
Method overloading
A Java program to illustrate method overloading
Final methods
Object as a class member variable
A Java program to illustrate that Java objects can be used as class members

Session 10: Constructors
Concept of Constructor
- Null constructor
- Explicit Constructor
- Parameterised constructor

A Java program with explicit constructors

Session 11: Inheritance
Inheritance basics
Advantage of inheritance
Deriving classes – Extends
A Java program to illustrate class inheritance
Usage of super
Using super to call super class constructor
A Java program illustrating "super"

Session 12: Inheritance continued...
Method overriding
A Java program showing method overriding
Abstract Base Class and Methods
A Java program showing usage of Abstract Base Class

Session 13: Inheritance continued...
Access modifiers
- private
- protected
- public
- default

A Java program illustrating the accessibility of member variables and methods

Session 14: Packages
Packages
- Defining a package
- Import statement
- Understanding CLASSPATH
- A short package example

Session 15: Package Continued…

Access protection revised : Package (default)
- Classes in same package
- Classes in different package
- Sub classes in same package
- Sub classes in different package

Session 16: Arrays in Java

Concept of array
Rules for declaring arrays
Array indexing
Accessing array elements
A Java program to demonstrate an array
Array initialisation
One dimensional array
Array as class data member
A Java program to illustrate array as class data member
Two dimensional array
A Java program to demonstrate a two dimensional array

Session 17: Arrays in Java Continued…

Array of objects
A Java program illustrating array of objects
A brief idea about String
Concatenation of String

Session 18: Exception Handling

Exception handling fundamentals
Predefined exception
Triggering a predefined exception (ArithmeticException)
A Java program which triggers an exception
Handling the exception
- try..catch construct and finally clause

A Java program to illustrate try..catch construct

Session 19: Exception Handling Continued...

Multiple catch clauses and finally clause
Command line arguments
A program illustrating command line arguments and multiple catch clauses
- (ArrayIndexOutOfBoundsException, NumberFormatException)

Session 20: Exception Handling Continued...
Creating your own exception subclasses
A program using user defined exception
Usage of throw
Usage of throws
A program to demonstrate throws

Session 21: Input/Output: Exploring java.io
Java InputStream & OutputStream classes
System.in & System.out object
A Java program to read keyboard characters
DataInputStream class & BufferedReader class

Session 22: File Input/Output: Exploring java.io Continued…
Reading File using FileInputStream class
Java FileOutputStream class
Writing onto file using FileOutputStream class