

PIXEL COMPUTER INSTITUTE, MEERUT

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Syllabus : JAVA

Duration : 60 hrs (Each Session 1 hour)

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

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- 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

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- 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

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- 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

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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, SortedQueue, etc.
- Using Random class
- Using user defined class for DataStructure
- Using Date and Formatting Date class.
- Using Properties in a Java Program

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- Reflection Overview, Annotation Overview

Session 36 – 39

- SQL Basics
- Creating table
- CRUD Operation
- What is JDBC, Driver architecture
- Using Driver Manager, Connection, Statement
- Using ResultSet to fetch data
- Using ResultSet for CRUD 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

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Session – 43 – 53

● Live Project

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