

JAVA FULL SYLLABUS

Topics under Java Course Syllabus

1. Core Java
2. Advanced Java

Module 1: Introduction

- Java Why? What? How? When? Where?
- Different Java Versions
- How Java is different from other Technologies

Module 2: Introduction To Java Programming Environment

- How to Install & Set Path
- A Simple Java Program
- Compiling & executing Java Program
- Phases of Java Program
- Analysis of a Java Program
- Understanding Syntax and Semantic Error
- Runtime Exception
- Name of a Java Source File
- Platform Independency
- Java Technology (JDK, JRE, JVM, JIT)
- Features of Java
- Text Editors
- Consoles

Module 3: Fundamentals of Java Programming

- The naming convention of Java language
- Comments, Statements
- Blocks (Static, Non-static/instance)
- Identifiers, Keywords, Literals
- Primitive Data Types, Range
- Reference (User-defined) Data type
- Variables (Primitive, Reference)
- Type Casting, Default Value

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- Operators

Module 4: Control Structures

- Working with Control Structures
- Types of Control Structures
- Decision Control Structure (if, if-else, if-else if, switch –case)
- Repetition Control Structure (do-while, while, for)

Module 5: Input Fundamentals And Datatypes In Java

- Java program inputs from Keyboard
- Methods of Keyboard inputs
- Scanner, Buffered Reader
- Problem Solving
- Java Array
- Instantiation of an Array
- String vs character array Accessing Array
- Elements, Default Value, for-each loop, var args
- Length of an Array (What is –Array Index Out Of Bounds Exception)
- Increasing, Decreasing the Size and Copy of an Array
- Multi-Dimensional Arrays
- Application Compilation and Run

Module 6: Object-Oriented Programming (Oops Concepts In Deep) (Duration-4hrs)

- Procedural Vs Object-Oriented Program
- Different types of Program Procedural Vs Object Oriented.
- Top-Down Vs Bottom-Up Approach
- Introduction to Object-Oriented
- Abstraction, Encapsulation, Inheritance
- Polymorphism
- Introduction to Classes and Objects
- Custom Class Definition
- Instance and Static Variables
- Different ways to create Object Instance
- Instance Variable and its role in a Class

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- Constructors, types of Constructor, Constructor Rule, Constructor Overloading
- Static Variable and its use
- Methods and their behavior
- Constructor vs Methods
- “this” Keyword
- Java Access Modifiers (and Specifiers)
- Call by value, Call by reference

Module 7: Command-Line Arguments

- What is a Command-Line Argument?
- Java Application with Command-Line Arguments
- Conversion of Command-Line Arguments
- Parsing Command-Line Arguments
- Using methods (Static, Non-Static)

Module 8: Integrated Development Environment

- Using various Editors
- Program Compilation, Execution in Editor
- Using Eclipse IDE
- Project Set-Up
- Source File Generation
- Application Compilation and Run

Module 9: Inner Class

- First View of Inner Class
- Outer Class Access
- Types of Inner Class

Module 10: Inheritance

- Complete concepts of Inheritance
- Sub-Classes
- Object Classes
- Constructor Calling Chain
- The use of “super” Keyword
- The use of “private” keyword inheritance.

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- Reference Casting

Module 11: Abstract Classes and Inheritance

- 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 the object of Interface

Module 12: Polymorphism (Duration-1hr)

- Introduction to Polymorphism
- Types of Polymorphism
- Overloading Methods
- Overriding Methods
- Hiding Methods
- Final Class and Method
- Polymorphic Behavior in Java
- Benefits of Polymorphism
- "Is-A" vs "Has-A"
- Association Vs Aggregation

Module 13: Package

- Package and Classpath and its use
- First, look into Packages
- Benefits of Packages
- Package Creation and Use
- First, look into the Classpath
- Classpath Setting
- Class Import
- Package Import

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- Role of public, protected, default and private w.r.t package
- Namespace Management
- Package vs Header File
- Creating and Using the Sub Package
- Sources and Class Files Management

Module 14: Using Predefined Package & Other Classes

- 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
- String, StringBuffer, StringBuilder Class
- String Constant Pool
- Various usage and methods of String, StringBuffer, StringBuilder
- Wrapper Classes
- System Class using GC(), exit(), etc.

Module 15: New Concepts In Package

- Autoboxing and Auto unboxing
- Static import.
- The instance of the operator.
- Enum and its use in Java
- Working with jar

Module 16: Garbage Collection

- Garbage Collection Introduction
- Advantages of Garbage Collection
- Garbage Collection Procedure
- Java API

Module 17: Exception Handling

- Introduction to Exceptions
- Effects of Exceptions
- Exception Handling Mechanism

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- 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

Module 18: Multithreading (Duration-3hrs)

- Introduction
- Advantages
- Creating a Thread by inheriting from Thread class
- Run() and start() method
- The constructor of Thread Class
- Various Method of Thread Class
- Runnable Interface Implementation
- Thread Group
- The Thread States and Priorities
- Synchronization method, block
- Class & Object Level Lock
- Deadlock & its Prevention
- Inter thread Synchronization
- Life Cycle of Thread
- Deprecated methods : stop(), suspend(),resume(), etc

Module 19: Input and Output Streams (Duration-3hrs)

- Java I/O Stream
- I/O Stream – Introduction
- Types of Streams
- Stream Class Hierarchy
- Using File Class
- Copy and Paste the content of a file
- Byte Streams vs Character Streams

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- Text File vs Binary File
- Character Reading from Keyboard by Input Stream Reader
- Reading a Line/String from Keyboard by Buffered Reader
- Standard I/O Streams Using Data Streams to read/write
- primitive data
- PrintStream vs PrintWriter Using StreamTokenizer and RandomAccessFile

Module 20: Serialization (Duration-0.5hr)

- Introduction to Serialization
- Using Object Streams to read/write object
- Transient Keyword
- Serialization Process, Deserialization Process