



**IDM TECHPARK**  
GUIDE'S FOR PERFECT CAREER PATHWAY



# Java Course Syllabus



**N.S.D.C.**  
National  
Skill Development  
Corporation



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# About Us

IDMTECHPARK global retail & corporate training solutions provider in Coimbatore, Erode, Trichy & Salem that offers a comprehensive range of training and placement services for both fresher's and professionals seeking new opportunities. The company commenced its IT training business in 2016. A pioneer in IT education, over the years, we have trained over 50k students. Idmtechpark has a wide range of courses, maintains education standards & provides placement assistance.

[www.idmtechparkcoimbatore.com](http://www.idmtechparkcoimbatore.com)  
[www.idmtechparkerode.com](http://www.idmtechparkerode.com)

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# About IDMTECHpark Education Quality

IDMTECHPARK is managed and developed by industry specialists with more than 8 years of expertise in the field. IDMTECHPARK offers a staff of highly skilled professional trainers who deliver effective IT training in a friendly setting, concentrating on the needs of each individual to help them succeed in a demanding work world. In the book of career and success, our staff never leaves a page unturned.

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IDMTECHPARK's versatile instructor-led training class rooms and lower-class sizes enable people to engage more easily and absorb knowledge, resulting in remarkable results for both themselves and the organizations for which they work. Our training programmes are adaptable and customizable to ensure that each participant gets the most out of their time with us. IDMTECHPARK focuses in providing hands-on IT training in over 30 different courses.

- We teach in-demand courses
- We provide impactful learning material
- Our teachers are well-selected & trained
- We follow world-class teaching methods
- Our courses include E-Projects
- We conduct technical workshops
- Exams are held and based on Exams providing Certification
- Certificates are recognized the world over
- Our course timings are flexible





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# Our Recent Placement

Idmtechpark assists students in getting job placements on successful completion of their courses. Idmtechpark also provides recruitment assistance to organizations. Idmtechpark students are shortlisted based on the organization's requirement. To make students job-ready, Idmtechpark conducts workshops e.g. How to do Group Discussions, how to behave in a Personal Interview. From time to time, job fairs & campus recruitments are conducted. Workplace skills such as time management, making effective presentations and communication skills are also provided. All this helps students find appropriate jobs in the IT industry while also helping save companies recruitment costs.

**Krishnaveni M**

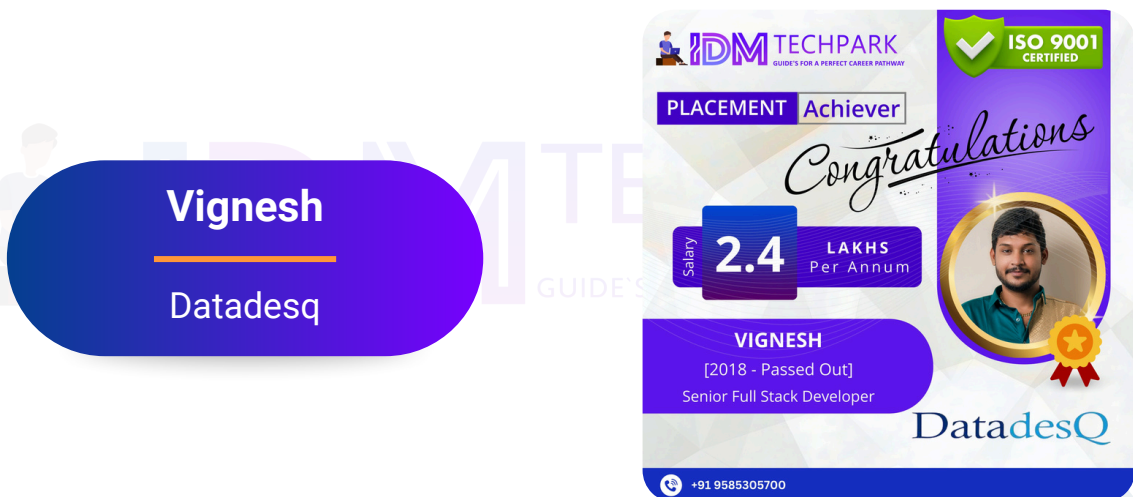
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**Surya**

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**Pavithra**

Vel Info Tech



**Poovitha**

Gray Matter



**Ramesh**

TDT

**Siva Sankar**  
 ST Cloudspark tech



**Nabeel Hisham**  
 VTail



**Kalayarasan**  
 Violet Infotech

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# Our Alumni Working At



## MODULE 1

# Introduction to Java Programming

- What is Java? (History and Overview)
- Java Development Kit (JDK) and Java Runtime Environment (JRE)
- Setting up the Development Environment (IDE: IntelliJ, Eclipse, or VS Code)
- Introduction to Basic Programming Concepts
- Writing your first Java program (Hello World)
- Basic Java Syntax: Variables, Data Types, Operators, and Expressions
- Java's Execution Model (Bytecode, JVM)



## MODULE 2

# Java Data Types and Variables

- Primitive Data Types in Java: int, float, double, char, boolean
- Reference Data Types (Objects, Arrays)
- Type Casting and Type Conversion
- Constants and Literals (final keyword)
- Variable Scope and Lifetime
- Constants in Java (Static Final Variables)
- Autoboxing and Unboxing

## MODULE 3

# Control Flow Statements

- Conditional Statements: if, if-else, nested if
- Switch-Case Statements
- Loops: for, while, do-while
- Break and Continue Statements
- Java 14+ Enhanced switch expressions
- Nested Loops and Nested Conditionals
- Exercises on control flow logic

## MODULE 4

# Functions and Methods

- Defining Functions/Methods in Java
- Method Parameters and Return Types
- Method Overloading
- Recursion in Java
- Variable Argument Lists (Varargs)
- Scope and Lifetime of Variables (Local, Instance, and Static variables)
- Method Chaining

## MODULE 5

# Object-Oriented Programming (OOP) Concepts

- Introduction to OOP Principles: Encapsulation, Inheritance, Polymorphism, and Abstraction
- Creating Classes and Objects in Java
- Constructor Methods (Default, Parameterized)
- Access Modifiers: public, private, protected, default
- Instance Variables vs. Static Variables
- Understanding this keyword



## MODULE 6

# Inheritance in Java

- What is Inheritance?
- Extending a Class using extends
- Method Overriding
- The super Keyword
- Constructor Inheritance
- The Object Class and the equals(), hashCode(), and toString() methods
- IS-A Relationship and Code Reusability
- Polymorphism in Java

## MODULE 7

# Polymorphism and Method Overloading

- Understanding Polymorphism
- Method Overloading vs Method Overriding
- Dynamic Method Dispatch
- Compile-time vs Runtime Polymorphism
- Interfaces and Abstract Classes for Polymorphism
- Covariant Return Types in Method Overriding

## MODULE 8

# Abstraction and Interfaces

- Abstract Classes and Methods
- The abstract Keyword
- Interfaces: Definition and Use
- Implementing Interfaces in Java
- Multiple Interfaces Implementation
- Default Methods in Interfaces (Java 8)
- Functional Interfaces and Lambda Expressions

## MODULE 9

# Exception Handling in Java

- What are Exceptions?
- Types of Exceptions (Checked and Unchecked)
- try-catch-finally Blocks
- Throwing and Catching Exceptions
- Custom Exceptions in Java
- The throws keyword and exception propagation
- Handling Multiple Exceptions
- Java 7+ Try-with-Resources Statement



## MODULE 10

# Java Collections Framework - Part 1

- Introduction to Collections in Java
- List Interface: ArrayList, LinkedList, Vector
- Set Interface: HashSet, LinkedHashSet, TreeSet
- Difference between List and Set
- Collection Operations (add, remove, contains, size)
- Iterating through Collections using Iterators
- Sorting Collections (Comparable vs Comparator)

## MODULE 11

# Java Collections Framework - Part 2

- Queue Interface and Deques (LinkedList, PriorityQueue)
- Map Interface (HashMap, TreeMap, LinkedHashMap)
- HashMap vs TreeMap vs LinkedHashMap
- NavigableMap and SortedMap
- Concurrent Collections (CopyOnWriteArrayList, ConcurrentHashMap)
- Collection Views (Set, List, Map)
- Generics in Collections

## MODULE 12

# Java Naming and Directory Interface (JNDI)

- Introduction to JNDI
- JNDI Lookup and Data Sources
- Binding and Retrieving Objects from JNDI
- JNDI Context and Environment Configuration
- JNDI with EJB and JMS
- JNDI and Database Connections

## MODULE 13

# String Handling and Regular Expressions

- Introduction to Strings in Java
- String Class: Methods (length, charAt, substring, concat, etc.)
- StringBuilder and StringBuffer for Mutable Strings
- String Pool in Java
- Comparing Strings (equals(), compareTo())
- Regular Expressions (Regex) in Java
- Pattern and Matcher classes for Regex

## MODULE 14

# Java 8+ Features – Functional Programming

- Introduction to Functional Programming
- Lambda Expressions in Java 8
- Method References
- The FunctionalInterface annotation
- Streams API (Streams Creation, Intermediate and Terminal Operations)
- Filter, Map, Reduce Operations in Streams
- Collectors Utility
- Optional Class

## MODULE 15

# Java Input and Output (I/O)

- Introduction to Java I/O
- Byte Streams (FileInputStream, FileOutputStream)
- Character Streams (FileReader, FileWriter)
- Buffered Streams (BufferedReader, BufferedWriter)
- Object Streams (ObjectInputStream, ObjectOutputStream)
- Serialization and Deserialization in Java
- Java NIO (New I/O) - Path, Files, NIO Channels



## MODULE 16

# Java Multithreading and Concurrency

- Introduction to Multithreading in Java
- Creating Threads (Extending Thread, Implementing Runnable)
- Thread Lifecycle and States
- Thread Synchronization (synchronized keyword)
- Locks and Deadlock
- Executor Framework (ThreadPoolExecutor, Executors)
- Callable and Future Interface
- Java Concurrency Utilities (CountDownLatch, Semaphore, CyclicBarrier)

## MODULE 17

# Java Memory Management and Garbage Collection

- Introduction to Memory Management in Java

- Heap, Stack, and Method Area

- Garbage Collection in Java (GC Algorithms)

- Garbage Collector's Workings

- Finalization and finalize() method

- Memory Leaks and Troubleshooting

- Java Performance Tuning Basics

## MODULE 18

# Design Patterns in Java

- What are Design Patterns?
- Creational Patterns (Singleton, Factory, Abstract Factory)
- Structural Patterns (Decorator, Adapter, Proxy)
- Behavioral Patterns (Observer, Strategy, Command, Chain of Responsibility)
- Best Practices for using Design Patterns
- Real-World Examples of Patterns in Java

## MODULE 19

# Java Networking

- Introduction to Networking Concepts
- Sockets and IP Addressing
- Java.net package: URL, URLConnection, Socket, ServerSocket
- Client-Server Communication
- Datagram and TCP/IP Protocols
- Java HTTP Communication
- Multithreaded Server Design

## MODULE 20

# Java Database Connectivity (JDBC)

- Introduction to Databases and JDBC
- Establishing Connection with a Database
- CRUD Operations in JDBC (Create, Read, Update, Delete)
- PreparedStatement vs Statement
- Transactions and Rollback
- Connection Pooling
- Handling Database Errors in Java

## MODULE 21

# Java GUI Development with Swing

- Introduction to GUI Programming
- Swing Components (JFrame, JButton, JTextField, etc.)
- Event Handling in Swing
- Layout Managers in Swing
- Menus, Toolbars, and Dialogs in Swing
- MVC Design Pattern in Swing
- Building a Simple GUI Application



## MODULE 22

# Java Web Development Basics (Servlets & JSP)

- Introduction to Web Development in Java
- HTTP and Servlet Basics
- Setting up a Web Server (Tomcat, Jetty)
- Creating a Simple Servlet
- JavaServer Pages (JSP) Overview
- MVC Architecture in Java Web Applications
- Introduction to Web Containers

## MODULE 23

# Spring Framework Basics

- Introduction to Spring Framework
- Spring Core: Inversion of Control (IoC) and Dependency Injection (DI)
- Setting up Spring in a Java Project
- Spring Beans and Annotations
- Spring AOP (Aspect-Oriented Programming)
- Spring Boot Overview and Creating Simple Spring Boot Applications
- Spring Data and Spring Security Basics

## MODULE 24

# Testing in Java

- Introduction to Unit Testing in Java
- JUnit 4 vs JUnit 5
- Writing Unit Tests with Assertions
- Mocking with Mockito
- Test-Driven Development (TDD) Basics
- Integration Testing in Java
- Code Coverage Tools (JaCoCo)

## MODULE 25

# Java Project and Capstone

- Planning and Designing a Full Java Application
- Choosing an appropriate Project: CLI, GUI, Web, or Mobile App
- Integrating Java with Databases (JDBC, Hibernate)
- Implementing OOP, Design Patterns, and Concurrency
- Unit Testing and Debugging the Project
- Final Project Demo and Code Review
- Preparing for Interviews and Job Readiness

## MODULE 26

# Core Java Fundamentals

- Introduction to Java & Setup
- Java Basics: Syntax & Data Types
- Object-Oriented Programming (OOP) in Java
- Exception Handling
- Collections Framework & Generics
- Multithreading & Concurrency

## MODULE 27

# SQL & Database Management with Java

- Introduction to Databases & SQL
- JDBC (Java Database Connectivity)
- Advanced JDBC & Connection Pooling
- ORM (Object-Relational Mapping) with Hibernate
- Spring Data JPA
- Transactions & Stored Procedures in Java



## MODULE 28

# Web Development with Java

- Introduction to Web Development with Java
- Building Java Web Applications with JSP & Servlets
- Spring Boot Basics
- Spring Boot with REST API
- Authentication & Security
- Integrating SQL & NoSQL Databases

## MODULE 29

# Advanced Java Concepts & Microservices

- Microservices with Spring Boot
- Unit Testing & Integration Testing
- Docker & Kubernetes for Java Application
- NoSQL with Java (MongoDB, Redis)
- Cloud Deployment (AWS, Azure, GCP)

**MODULE 30**

# Performance Optimization & Capstone Project

- Performance Optimization & Best Practices
- Capstone Project

# Thank You

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