SYLLABUS

PROGRAMMING LANGUAGES · COURSE HANDOUT 2026

JAVA

P . COLLECTIONS . GENERICS
STREAMS . CONCURRENCY
EN . TESTING . SPRING INTR

DURATION	LEVEL	MODULES	MODE
70 Hours	**Beginner to Advanced**	**8**	**Classroom · Online · Hybrid**

01 COURSE OVERVIEW

A Java course from language fundamentals to concurrency, streams and build tooling. The course teaches modern Java (17+) with records, sealed types and pattern matching alongside the classic collections and concurrency material, and covers the JVM behaviour that explains performance and memory issues.

Learners build a console application, a library and a small service.

WHO IT IS FOR

- Beginners targeting enterprise development
- Developers moving from other languages
- Students preparing for placements
- Professionals working on Java codebases

PREREQUISITES

Basic programming logic helps but is not required.

02 LEARNING OUTCOMES

01 Write object-oriented Java with clean interfaces.

02 Use collections, generics and comparators correctly.

03 Process data with streams and optionals.

04 Handle exceptions and resources safely.

05 Write concurrent code with executors.

06 Understand JVM memory and garbage collection basics.

07 Build and test with Maven and JUnit.

03 MODULE STRUCTURE

8 MODULES

01 JAVA BASICS

- JDK and JVM
- Types
- Operators
- Control flow
- Arrays
- Strings and StringBuilder
- Methods

LAB

CONSOLE PROGRAMS

02 OBJECT-ORIENTED JAVA

- Classes and objects
- Encapsulation
- Inheritance
- Interfaces and default methods
- Abstract classes
- Records
- Sealed types

03 COLLECTIONS AND GENERICS

- List, Set, Map implementations
- Iterators
- Comparable and Comparator
- Generics and wildcards
- Immutable collections

LAB

DATA STRUCTURES

04 STREAMS AND FUNCTIONAL JAVA

- Lambdas
- Method references
- Stream pipeline
- Collectors
- Optional
- Parallel streams and their caveats

05 EXCEPTIONS AND IO

- Checked vs unchecked
- try-with-resources
- Files and NIO
- Serialisation
- JSON with Jackson

LAB

FILE PROCESSING

06 CONCURRENCY

- Threads
- Executors
- Synchronisation
- Virtual threads overview
- Runnable and Callable
- CompletableFuture
- Concurrent collections

07 JVM AND PERFORMANCE

- Memory areas
- Profiling
- JIT overview
- Garbage collection basics
- Common leaks
- Diagnostics tools

08 BUILD AND TEST

- Maven lifecycle
- JUnit 5
- Assertions
- Dependencies
- Mockito
- Spring Boot introduction

PROJECT

TESTED JAVA SERVICE

04 ASSESSMENT & CERTIFICATION

Module assignments and labs	**25%**
Mini projects	**20%**
Internal assessments	**15%**
Final project and review	**40%**

CERTIFICATION

Learners who complete all modules, submit the final project and clear the review receive a course completion certificate from Kaizen Infinities Private Limited. Project work is documented for the learner's portfolio, and interview preparation is included in the closing sessions.

05 CAREER OUTCOMES

ROLES THIS PROGRAMME PREPARES FOR

JAVA DEVELOPER **BACKEND ENGINEER** **ANDROID DEVELOPER (JAVA)** **SOFTWARE ENGINEER** **ENTERPRISE DEVELOPER**

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