



# Java For Beginners

Duration 4 day(s) (JAVA-04)

Java development with Eclipse

## Description

We propose you to discover Java, the most used language in business through pedagogical lab and progressive allowing you to have the basics to program in Java or apprehend the many frameworks of its ecosystem. Feel free to follow our many other advanced courses on Java as well.

## Goals

- Discover and implement Object programming with Java
- To be able to model and manipulate real world objects
- Know how to use the Eclipse IDE for Java application development
- Understand the structure and architecture of modern applications

## Public

- Architect
- Developer
- Project Manager

## Prerequisites

- Object development concept

## Structure

50% Theory, 50% Practice

## Program

### Presentation of the language

- Presentation and history of language
- The Java ecosystem: Java SE, Java EE

### The development environment

- Presentation of the JDK
- Introduction to Eclipse (Integrated Development Environment)
- Perspectives, views and editors
- Edit, compile and execute code
- Document the code with Javadoc
- Import external libraries
- Wizards, keyboard shortcuts, tips and tricks
- Refactoring: formatting, import management, code generation

### Declarations and access control (java.lang)

- JavaBean standard and validity of identifiers
- Declare a class, organization into packages
- Declare members of a class
- Data types: primitive types, references, tables
- Declare a property
- Declare a method: parameters and type of return
- Builder concept, instantiation process
- Abstract classes and interfaces
- Access control
- Visibility modifiers: public, protected, package, private
- Other modifiers: final, static

### Object programming (java.lang)

- Introduction to object design, notions of class and instance
- Introduction to UML notation: class and sequence diagrams
- Principles of strong encapsulation and weak coupling
- Composition concept (« HAS-A »)
- Notions of inheritance (« IS-A »), polymorphism, cast
- Overloading (« overloading ») and overriding (« overriding »)
- Notion of object identity: equals and hashCode

### Operators (java.lang)

- Assignment
- Equality and comparison
- Boolean operators
- Instanceof

### Control structure and exceptions (java.lang)

- Tests: if, switch
- Loops: for, foreach, while, do-while
- Notions of exceptions
- Declaration in the signatures of the methods
- Capture and treatment with « try/catch »
- Notion of « finally » block
- Hierarchy of exceptions, « checked » vs « runtime »

### Paintings and Collections (java.util)

- Collection types: List, Set, Map
- Understanding the collections API: introduction to parameter types (« generics »)
- Choose the right collection
- Browse a collection or table: Iterator concept
- Sort a collection or table: Comparable and Comparator
- Search a collection or table

### Formatting and Internationalization (java.text)

- Notion of Locale
- Format dates and numbers with DateFormat and NumberFormat
- Format messages with MessageFormat and ChoiceFormat
- Outsource messages with ResourceBundle

### I/O Files (java.io)

- Text flow (Reader/Writer) and binary (Streams)
- Hierarchy of classes of java.io and notion of adapting
- Write and read a text file on disk with BufferedReader and PrintWriter
- Notion of serialization, transient variables
- Write and read a graph of objects on disk with ObjectOutputStream and ObjectInputStream

### I/O Network (java.io)

- Network and port address concept
- Socket concept
- Connecting to a server in TCP, reading and writing the stream
- Development of a server
- Notion of protocol, presentation of existing protocols

### Access to databases with JDBC (java.sql)

- Opening a connection
- Make a write request