



# Java Programming

## Abstract

Java is one of the most popular programming languages.

It is an Object Oriented, portable, fast and rich language. Java provides many services out of the box (e.g. memory management, security) which help developers be more productive.

The course is intended for anyone who wants to enter the 'Java World'.

The course includes many examples and hands-on exercises through which the material is demonstrated and practiced.

The course is based on Java 6.

## Target Audience

Developers that want to learn the Java language.

## Prerequisites

Familiarity with Object Oriented concepts.

## Content:

### Introduction to Java (1 hour):

- The History of Java.
- Java's Key Features.
- The Java Virtual Machine.
- The First Application.

### Basic Syntax (1 hour):

- Identifiers.
- Comments.
- Keywords.
- The Eight Primitives.
- Using Objects.

### Expressions (2 hours):

- Using Operators.
- The 'If-Else' Statements.
- Using 'While' Loop.
- Selecting with 'Switch' statement.

Dealing with Primitive Casts.

**Using Arrays (1 hour):**

Creating an Array.  
Array Initialization.  
Working with Arrays.  
Using Multi-dimensional Arrays.

**Java Classes – part 1 (3 hours):**

Classes & Packages.  
The 'import' Statement.  
The Importance of Encapsulation.  
Java Constructors.  
Access Modifiers (private, default and public).  
Method Overloading.

**Java Classes – part 2 (4 hours):**

Polymorphism and Inheritance.  
The 'Protected' Modifier.  
Using 'this' and 'super'.  
The 'final' keyword.  
Static Members & Methods.

**Java Classes – part 3 (4 hours):**

Interfaces & Abstract Classes.  
The Complete Construction Process.  
The Class 'Object'.  
Nested Classes.  
Enums in Java.

**Basic Design Patterns (2 hours):**

Basic Concepts of Design Patterns.  
The Singleton Design Pattern.  
The Factory Design Pattern.

**Exceptions & Assertions (3 hours):**

Types of Program Errors.  
The Exception Model.  
Checked and Unchecked Exceptions.



Defining Custom Exceptions.  
Assertions.

**Classpath & JARs (1 hour):**

The 'Classpath' in Java.  
Java Archives.

**Working with Common Classes (2 hours):**

java.lang.String  
java.lang.System  
java.util.Calendar

**The Java Collection Framework & Generics(5 hours):**

List Basics.  
Using Lists Wisely.  
Other Collection Classes.  
Maps.  
Generics.

**Java IO (3 hours):**

InputStream/OutputStream.  
The Decorator Pattern.  
Java Serialization.  
Readers & Writers.  
Working with Files.

**Multi-Threading (5 hours):**

Introducing Concurrent Programming.  
Creating Java Threads.  
Concurrency Problems and Synchronization.  
Wait and Notify.  
Concurrent Data Structures.

**Networking (3 hours):**

Overview.  
TCP/IP Sockets.  
Writing Your Own Web Server.



**Duration:        5 days.**