



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 (2 hours):

- Identifiers.
- Comments.
- Keywords.
- The Eight Primitives.
- Creating Instances using 'New'.

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 (2 hours):

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

Java Classes – part 2 (3 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 (3 hours):

Basic Concepts of Design Patterns.



The Singleton Design Pattern.
The Factory Design Pattern.

Exceptions & Assertions (2 hours):

The 'try-catch-finally'.
Compile-time Exceptions.
Describing Common Exceptions.
Creating Custom Exceptions.
Using Assertions.

IDE, Classpath & JARs (2 hours):

The 'Classpath' in Java.
Creating Archives.
Debugging with the IDE.

Working with Common Classes (2 hours):

java.lang.String
java.lang.Math
java.lang.System
java.util.Scanner
java.util.Calendar

The Java Collection Framework & Generics(4 hours):

Overview on the JCF.
Collection, List, Set and Map.
Understanding the Implementations.
Working with Generics.

Java IO (4 hours):

Using the File IO.
InputStream/OutputStream.
The Decorator Design Pattern.
Java Serialization.
Readers & Writers.



Multi-Threading (4 hours):

Introducing Concurrent Programming.
Creating Java Threads.
The 'synchronized' Keyword.
Working with wait/notify.

Networking (4 hours):

Networking Overview.
Working with Sockets.
Create a Client-Server Application.

Duration: 5 days.