JAV100 : Java Programming Fundamentals

Code : JAV100 **Duration :** 5 days **Category :** Java

Audience :

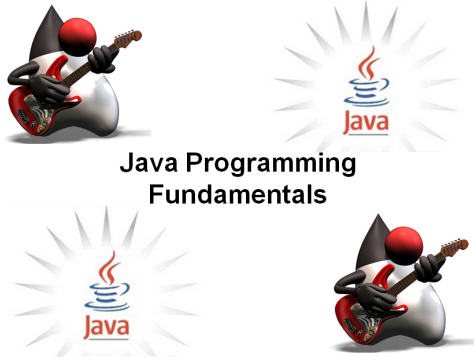
Developers who want to start with Java Programming and other persons who want to understand Java code.

Prerequisites :

Basic knowledge of and experience with programming is required. Principles of Object Oriented Programming using Java are explained. Prior knowledge of this is beneficial to the understanding.

Realization :

The theory is treated on the basis of presentation slides and is interspersed with exercises. Demos are used to clarify the theory. The course material is in English.



Contents :

This course covers the basic principles of the Java platform and latest version of the Java programming language. On the basis of incremental exercises in a case study, participants learn to program with the variables, data types, operators and control flow constructs of the language. The course also treats the object oriented concepts like class, object, inheritance and polymorphism. Attention is paid to error and exception handling in Java and it is discussed how Java software is packaged. The splitting of a Java program into several subtasks through threads and the synchronization of these threads is also a subject in the course. Finally newly introduced features in Java language like the parameterized types, generics, and their use in the Collection Framework are part of the course program. Optional modules are the access of Databases with JDBC, Java Beans and Graphical User Interfaces, GUI's. These modules can be treated if time permits. This course is a good preparation for the Java 7 or Java 8 Programmer Exam Part I (1Z0-803) or (1Z1-808). In combination with the course Advanced Java Programming the course also prepares for the Java 7 Programmer Exam Part II (1Z0-804).

Module 1 : Basic Concepts

History of Java
Java Overview
Java Editions
Java Platform
Java Community Process
Java Libraries
Java Language
Java Security
Application Types
Compiling Java Programs
Running Java Programs
Compiler and Interpreter
Application Structure
Garbage Collection

Module 2 : Language Syntax

Java Comments
Variables
Types of Variables
Primitive Data Types
Block Statements
Operator Precedence
Flow Control
if else Statements
switch Statement
for and while Loop
do while Loop
break and continue
Arrays
Enhanced for Loop
Strings
Formatted Output

Module 3 : Classes and Objects

Classes and Objects
Class Definition
Encapsulation
Access Modifiers
Constructors
Creating Objects
Fields and Methods
Using Objects
static Modifier
static Blocks
Object Initializers
this Keyword
Parameter Passing
Method Overloading
Variable Arguments
Object References
final Modifier
Object Destruction

Module 4 : Inheritance

Inheritance
extends Keyword
Overriding and Hiding
Polymorphism
Abstract Classes
Interfaces
Implementing Interfaces
Type Casting
Implicit Casting
Explicit Casting
Cloneable Interface
Cloning Objects

Module 5 : Exception Handling

Error Conditions
Exceptions in Java
Exception Handling Syntax
Exception Hierarchy
Multiple Catch Clauses
Multi Catch Clause
finally Clause
try with Resources
Exception Information
Predefined Exceptions
Common Exceptions
Throwing Exceptions
User Defined Exceptions
Chained Exceptions
Rethrowing Exceptions
Stack Traces
Assertions

Module 6 : Packages

Java Packages
Inside Java Packages
Java Standard Packages
Creating Packages
Importing Classes
Using Packages
CLASSPATH
import static
Visibility
Packaging in JAR
Runnable JARS

Module 7 :Threads

Multiple Threads
Benefits and Drawbacks
Thread Characteristics
Java Thread Model
Thread Class
Runnable interface
Extending Thread
Implementing Runnable
Daemon Threads
Thread Life Cycle States
Thread Alive States
Thread Class Methods
Sleeping and Yielding Control
Using join and interrupt
Thread Priorities
Suspending and Resuming

Module 8 : Synchronization

Concurrent Method Activation
Synchronization
Blocking on a Monitor
Mutual Exclusion in Java
Synchronized Statement
Locking and Statics
Deadlock
Condition Synchronization
Using wait and notify
while Loop and notifyall

Module 9 : Special Classes

Inner Classes
Types of Inner Classes
Anonymous Inner Classes
Inner Class Advantages
Enumerations
Old Enumerations Issues
Enum Types
Declaring Enums
Enums as Constant Objects
Enums are Classes
Enum Methods and Fields
Advantages new Enums

Module 10 : Utility Classes

Object Class
Wrapper Classes
Autoboxing and Unboxing
Overriding equals
Math Class
Date Class
Regular Expressions
Scanner Class
Process Class
Runtime Class
System Class
Locale Class
Localizing Dates
Localizing Numbers
Localizing Currencies
Javadoc

Module 11 : Collection Framework

Collection Framework
Framework Branches
Implementation Classes
Legacy Collections
Collection Interface
Iterator Interface
Concrete Collections
List Interface
ArrayList Class
LinkedList Class
Adding to LinkedList
Set and SortedSet
NavigableSet and Map
Comparable Interface
Comparator Interface
Map Interface
Optional Methods
Views

Module 12 : Generics

Generics Explained
Syntax Generic Class
Need for Generics
Benefits of Generics
Generic Class Examples
Generics in Collections
Generic Characteristics
Type Erasure
Bounded Type Parameter
Generics and Subtyping
Inheritance Relationships
Wildcards
Wildcards Arguments
Upper Bounded Wildcards
Lower Bounded Wildcards
Raw Types
Generic Methods

Module 13 : Stream I/O

I/O Basics
I/O Classes
Byte Stream Classes
Character Stream Classes
Standard I/O Streams
Stream Types
Data Sink Streams
Processing Streams
Buffered Streams
Reading Stream from Web
Data Conversion Streams
Serialization
Serializable Classes
Object Streams

Optional Module : JDBC

JDBC
JDBC Overall Architecture
JDBC Drivers
JDBC URL's
Making Connections
Executing a Statement
Retrieving Results
JDBC-ODBC Bridge

Optional Module : Java Beans

Software Components
Java Beans
Java Beans Terminology
Bean Component Model
Bean Event Pattern
Event Firing
Event Class
Event Listener Interface
Dispatching Events

Optional Module : GUI's

Abstract Window Toolkit (AWT)
Controls and Containers
Layout Managers
Event Listeners
Swing Library
Window Painting
Swing and Threads
Java FX
Scene Graph