

# Introduction to Java Programming

<b>Course No.</b>	3405
<b>Description</b>	This course provides an introduction to the Java programming language. It is designed to give programmers experienced in traditional technologies a smooth transition to Java. Students will learn the core language elements including control structures, operators, classes, inheritance, interfaces, exceptions, Java packages, and classes, applets and AWT. Extensive hands-on workshops are conducted.
<b>Audience</b>	This course is suggested for Application Developers who are new to the Java programming environment
<b>Prerequisites</b>	Programming experience with another language is strongly recommended. Knowledge of Object-Oriented concepts is helpful.
<b>Objectives</b>	<ul style="list-style-type: none"><li>• Learn core Java Language elements</li><li>• Use Java control structures and operators</li><li>• Learn to build classes Understand inheritance, abstract classes and interfaces</li><li>• Learn to handle errors using Java's exception handling techniques</li><li>• Know how to build applets</li><li>• Gain practical exposure to key class hierarchies and libraries (packages)</li><li>• Transitions from good traditional programming practices into effective java coding techniques</li></ul>
<b>Major Topics</b>	<ul style="list-style-type: none"><li>• Java Fundamentals</li><li>• Java language Basics</li><li>• Fundamentals of Objects</li><li>• Java Language Syntax Objects</li><li>• Java Language Syntax Details</li><li>• Object-Oriented Programming</li><li>• Classes and Interfaces</li><li>• Exception Handling</li><li>• Other Odds and Ends</li><li>• Creating GUIs with Java</li><li>• Event handling</li></ul>
<b>Format</b>	Lecture and hands-on workshops
<b>Duration</b>	5 days



## Course Contents

### 1. Java Fundamentals

- Why do we need Java?
- How did Java get here?
- Why is Java so Popular?
- What is the JDK?
- How do I compile Java?
- What is Bytecode?
- What is JVM
- Java documentation
- Final Notes
- Exercises

### 2. Java Language Basics

- Getting Started
- A simple Program
- Variables and Constants
- Simple math
- Strings and StringBuffer
- Comments
- Assignment Statement
- Classes
- Fields and Scope
- Parameters
- Method Calling
- Static
- Packages
- Directory Structure
- Final Notes
- Exercises

### 3. Fundamentals of Objects

- What are objects?
- Abstraction
- Interface versus Implementation
- Classes and Instances
- Constructors
- Object notation
- Naming Conventions
- Using Objects
- Static Members
- JDK Packages and Classes
- Wrapper Classes
- Final Notes Exercises

### 4. Classes

- Syntax Review
- Do the Math
- Operators
- Functions
- String Handling
- Concatenation
- Related Types
- Date & Calendar
- Formatting
- Relational Operators
- Logical Operators
- Flow of Control
- If...else
- Switch
- While & for loops
- Arrays of Primitives
- Arrays of Objects
- Using Arrays
- Arrays of Arrays
- Final Notes Exercises

### 5. Object-Oriented Programming

- Object Relationships
- Object Communication
- Inheritance
- Object Hierarchies
- Overridden methods
- Abstract and Final
- Polymorphism A new way of thinking
- Final Notes
- Exercises

### 6. Classes and Interfaces

- Object Typing
- Class definition
- Extends vs./ Implements
- Casting Revisited
- Interface Polymorphism
- Interface constants
- Cloneable Interface
- this
- finalize
- Final Notes



- Exercises

## 7. Arrays and Collections

- One Name, many Items
- Collections – the old
- Vector
- Enumeration
- Hashtable
- Collections – the new
- ArrayList
- LinkedList
- Iterator
- HashMap
- Final Notes
- Exercises

## 8. Exception Handling

- When things go wrong
- Java Class hierarchy
- Errors & Exceptions
- Types of Exceptions
- Catching Exceptions
- Not Catching Exceptions
- Throwing Exceptions
- Methods of Exceptions
- Defining your own Exceptions
- Throwing them
- Typical Exceptions
- Final notes
- Exercises

## 9. GUI Development with Java

- Overview
- Applets and Applications
- Painting and Drawing
- Fonts and Colors
- Visual Components
- Components Hierarchy
- Component Classes
- Menus and menuitems
- Layout Managers
- Applets
- Final Notes
- Exercises

## 10. Event Handling in Java

- Overview
- The Event model
- Types of Events
- Event Classes
- Event Interfaces
- Listeners
- Registering Listeners
- Event Methods
- Adapters
- Inner Classes
- Anonymous Classes
- Final Notes
- Exercises

