

Java™ 2 Programming Language (Third Edition)

Course Specifications

Course number: 085519

Software: Java 2

Course length: 5.0 days

Course Description

Welcome to *Java™ 2 Programming Language (Third Edition)*. Now that you have taken *Introduction to Programming (Second Edition)*, you have a solid foundation of programming concepts. This course expands upon those basic concepts and covers the essential elements of the Java programming language. This course offers you a job-related approach to successful Java programming. Finally, it provides all the basic skills required to develop functionally sound and efficient Java applications.

Course Objective: You will create simple Java applications. You will discover how control moves through a program. Next, you will explore the Java class libraries and how to use this information to program more effectively. You will discover how to create classes and program with objects. You will handle exceptions and create threads to provide concurrency and use the CPU efficiently. Finally, you will use Java collections and the Swing library to complete your Java application.

Target Student: This course is designed for an individual who wants to learn the syntax and structure of the Java programming language and components of the J2SE (Standard Edition) class libraries, as well as prepare for the Sun Java Programmer 1.4 certification exam.

Prerequisites: To ensure your success, we recommend you first take the Element K course, *Introduction to Programming (Second Edition)*, or have equivalent knowledge.

Delivery Method: Instructor led, group-paced, classroom-delivery learning model with structured hands-on activities.

Performance-Based Objectives

Upon successful completion of this course, students will be able to:

- Create, compile, and run a simple Java application.
- Control program flow by writing code to react to specific situations and produce correct results for the situation.
- Work with a Java class library to instantiate objects from Java classes.
- Create classes in the Java 2 programming language.
- Program with objects to write Java applications that are reusable, reliable, and understandable.
- Handle exceptions to detect and manage errors while your Java application is running.
- Create threads in your Java application to provide concurrency among multiple parallel execution subtasks, with or without synchronization.
- Use collections in a Java application.
- Develop a graphical user interface (GUI) using Swing library components to handle mouse and key events.

Course Content

Lesson 1: Creating, Compiling, and Running a Simple Java Application

- Topic 1A: Compile and Run a Simple Application
- Topic 1B: Create a Simple Class
- Topic 1C: Create and Initialize Variables
- Topic 1D: Write an Expression
- Topic 1E: Create and Initialize an Array
- Topic 1F: Access Array Data

Lesson 2: Controlling Program Flow

- Topic 2A: Write If Statements
- Topic 2B: Write a For Loop
- Topic 2C: Write While and Do...While Loops
- Topic 2D: Break Out of a Loop
- Topic 2E: Write a Switch Statement
- Topic 2F: Write a Conditional Operator Statement

Lesson 3: Working with the Java Class Libraries

- Topic 3A: Create a New Object from a Java Class Library
- Topic 3B: Call Methods
- Topic 3C: Cast and Convert Primitives and Objects
- Topic 3D: Compare Objects
- Topic 3E: Determine the Class of an Object

Lesson 4: Creating Classes

- Topic 4A: Define Methods
- Topic 4B: Overload a Method
- Topic 4C: Define Constructors
- Topic 4D: Create Static Class Members
- Topic 4E: Use Command-Line Arguments

Lesson 5: Programming with Objects

- Topic 5A: Import a Class
- Topic 5B: Extend a Class
- Topic 5C: Override Methods
- Topic 5D: Create Interfaces
- Topic 5E: Implement Interfaces
- Topic 5F: Create Inner Classes

Lesson 6: Handling Exceptions

- Topic 6A: Handle Exceptions

- Topic 6B: Write a Method to Throw a Checked Exception
- Topic 6C: Write and Enable Assertions

Lesson 7: Creating Threads

- Topic 7A: Create Threads by Extending the Thread Class
- Topic 7B: Create Threads by Implementing the Runnable Interface
- Topic 7C: Synchronize Threads

Lesson 8: Using Collections

- Topic 8A: Store Data in a Set
- Topic 8B: Retrieve Data from a Set
- Topic 8C: Store Data in a List
- Topic 8D: Retrieve Data from a List
- Topic 8E: Store Data in a Map
- Topic 8F: Retrieve Data from a Map

Lesson 9: Developing GUIs

- Topic 9A: Create a Container Using Swing
- Topic 9B: Create Swing Components
- Topic 9C: Apply Layout Managers
- Topic 9D: Handle Mouse Events
- Topic 9E: Handle Key Events

Appendix A: Works Cited