

Course Description: Java is a complete programming language which can be used to write applets that enhance existing Web pages, or embedded Web based applications. Through lecture and hands on labs, this course introduces students to all aspects of this high level programming language.

Who Should Attend: This course is designed for applications programmers and designers planning to develop applications running in Java enabled Browsers or as standalone executables.

Prerequisites: Students should have programmed in at least one programming language - preferably C or C++. Some familiarity with Object Oriented Programming is desired but not required.

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

- Compile and run a Java application
- Understand the role of the Java Virtual Machine in achieving platform independence
- Navigate through the API docs
- Use the Object Oriented paradigm in Java programs
- Understand the division of classes into Java packages
- Use Exceptions to handle run time errors
- Select the proper I/O class among those provided by the JDK

Course Outline:

Introduction

What is Java?
History
Versioning
The Java Virtual Machine
Writing a Java Program
Packages
Simple Java Programs

Language Components

Primitive Data Types
Comments
The for Statement
The if Statement
The while and do while Statements
The switch Statement
The break Statement
The continue Statement
Operators
Casts and Conversions
Keywords

Object-Oriented Programming

Defining New Data Types
Constructors
The String Class
String Literals
Documentation
Packages
The StringBuffer Class
Naming Conventions
The Date Class
The import Statement
Deprecation
The StringTokenizer Class
The DecimalFormat Class

Methods

Introduction
Method Signatures
Arguments and Parameters
Passing Objects to Methods
Method Overloading
Static Methods
The Math Class
The System Class
Wrapper Classes

Arrays

Introduction
Processing Arrays
Copying Arrays
Passing Arrays to Methods
Arrays of Objects
The Arrays Class
Command Line Arguments
Multidimensional Arrays

Encapsulation

Introduction

Constructors
The this Reference
Data Hiding
public and private Members
Access Levels
Composition
Static Data Members

Inheritance & Polymorphism

Introduction
A Simple Example
The Object Class
Method Overriding
Polymorphism
Additional Inheritance Examples
Other Inheritance Issues

Abstract Classes & Interfaces

Introduction
Abstract Classes
Abstract Class Example
Extending an Abstract Class
Interfaces

Exceptions

Introduction
Exception Handling
The Exception Hierarchy
Checked Exceptions
Advertising Exceptions with throws
Developing Your Own Exception Classes
The finally Block

Input and Output in Java

Introduction
The File Class
Standard Streams
Keyboard Input
File I/O Using Byte Streams
Character Streams
File I/O Using Character Streams
Buffered Streams
File I/O Using a Buffered Stream
Keyboard Input Using a Buffered Stream
Writing Text Files

Swing

Introduction
Frames
JComponent
JComponent Hierarchy
Menus
Content Pane
Buttons
Text Components
Layout Managers
FlowLayout
GridLayout

BorderLayout

Panels
Combining Layout Managers

Event Handling

The Java Event Model
Events
Event Sources
Event Listeners
Action Events
Window Events
Focus Events
Key Events
Mouse Events
Inner Classes
Anonymous Inner Classes

Threads

Threads vs. Processes
Creating Threads by Extending Thread
Creating Threads by Implementing Runnable
Advantages of Using Threads
Daemon Threads
Thread States
Thread Problems
Synchronization

Applets

Introduction
Creating an Applet
Applet Behavior
Adding Components and Events
Applet Tags
Reading Parameters
Applets and Threads

Appendix A: The Java Collections

Classes

Introduction
Vectors
Hashtables
Enumerations
Properties
Collection Framework Hierarchy
Lists
Sets
Maps
The Collections Class

Appendix B: Networking in Java

Networking Fundamentals
The Client/Server Model
InetAddress
URLs
Sockets
A Time-of-Day Client
Writing Servers
Client/Server Example

Appendix C: Accessibility

Accessible Applications
The ADA and Section 508 Regulations
Accessibility Needs
Java Support for Accessibility
The Java Accessibility API
AccessibleContext
Section 508 Accessibility Standards
Section 1194.21 (a) - Keyboard Access
Section 1194.21 (b) - Accessibility Features
Section 1194.21 (c) - Input Focus
Section 1194.21 (d) - Object Information
Section 1194.21 (e) - Bitmap Images
Section 1194.21 (f) - Textual Information
Section 1194.21 (g) - User Selected Attributes
Section 1194.21 (h) - Animation
Section 1194.21 (i) - Color Coding
Section 1194.21 (j) - Color and Contrast
Section 1194.21 (k) - Flicker Rate
Section 1194.21 (l) - Electronic Forms
The Java Accessibility Bridge
Resources