

Course Description: This 5-day course will introduce Java programmers to the Swing package. The Swing package, extending the AWT, provides efficient and easy-to-use tools for manipulating graphics. Students completing this course will have the ability to create fully-functional, customizable, graphical user interfaces.

Who Should Attend: This course is designed for Java programmers of any level.

Prerequisites: Java programming experience is required. Experience with the AWT is helpful, but not required.

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

- Describe the key features of Swing
- Contrast the use of Swing and the AWT
- Add components to a JFrame using the ContentPane
- Write Swing Applications using Swing components such as JLabel, JButton, JTextField, JTree, etc.
- Implement keystroke handling in response to keyboard events from a user
- Understand InputMap and ActionMap
- Use the printing capability to print GUIs
- Describe the Model View Controller Architecture
- Encode Model View Architecture components
- Write code that uses Border objects to alter the appearance of components
- Create programs using various Pane components such as JTabbedPane, JSplitPane, JScrollPane, and JOptionPane
- Write programs that support cut/paste and drag/drop

Course Outline:

An Introduction to Swing

Rational for the Swing Components
Java Foundation Classes
Lightweight Components
Features of the Swing Components
The AWT Components
An Example Using the AWT Components
Building a Minimum Swing Application

Window Events

Introduction
Window Positioning
Handling Window Events
Window Closing Styles
Inner Classes
Anonymous Inner Classes

Simple Swing Components

Introduction
JButton with Selected Fonts
JButton with an Icon
The Icon Interface
JButton with a Mnemonic
Labels

Keystrokes

The Focus
Focus Traversal
Keyboard Input
Keyboard Shortcuts
Keystrokes and Actions

Dialogs

What is a Dialog?
A Simple Dialog
Adding Components to a Dialog

Menus and Toolbars

AWT vs. Swing Menus
Adding Mnemonics
Adding Accelerators
Adding Colors, Fonts, and Icons
Toolbars

Painting and Graphics

Painting Basics
The paintComponent Method
Some Methods of the Graphics Class
Creating a Drawing Area
Drawing Area Source Code

Printing

Printing Basics
A Printing Example

Using the Book Class

Layout Managers

Introduction
FlowLayout
GridLayout
BorderLayout
CardLayout
GridBagLayout
GridBagConstraints
BoxLayout
OverlayLayout

Models, Views, and Controllers

Introduction
The MVC Process of JButton
Advantages to using the MVC Architecture
Pluggable Look and Feel
An MVC Example
Linking the Components
MVC Diagram
ListModel
AbstractListModel
JTable
TableModel
MVCList Source Code

Using the JTree

Tree Basics
The DefaultMutableTreeNode
DefaultTreeModel
Constructing a JTree
Customizing the JTree
Tree Listeners

Text Components

Various Text Components of Swing
JTextField
JPasswordField
JTextArea
Using a JScrollPane
JTextPane
StyleConstants
StyleTest Source Code

Utility Panes, Borders, and Focus

Various Utility Panes
JTabbedPane
JSplitPane
JFileChooser
JOptionPane
Using Borders

Creating Custom Components

Extending JComponent

Creating JButton
RButton's Model to View
The Constructor
More with Listeners
RButton Source Code

Clipboard and Drag & Drop

Clipboard
DataFlavors
System Clipboard vs. Custom Clipboard
More with DataFlavors
Drag & Drop

Appendix A: Events and Their Listeners

AWT Events
Swing Events

Appendix B: 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