This three-day course will teach students how to use Java™ Struts as a framework to develop web applications that follow the Model/View/Controller design pattern. The topics cover the components of Struts that are available from the Jakarta project of the Apache Foundation. The course illustrates what the components provide and use of them.

**Audience:** Experienced Java Servlet and JSP developers who need to use Struts as a framework for MVC Web Application Development.

**Prerequisites:** Java Programming, Java Web Programming, or Java2 Enterprise Edition. Java Servlet and JSP programming experience, and a basic understanding of HTML and XML is required.

**Number of Days:** 3 days

### 1. Struts Overview
- What is Struts?
- Model 1 Design Pattern
- Model 2 / MVC Design Pattern
- Implementing MVC with a Framework
- The Struts Framework
- Basic Struts Components
- Struts Documentation

### 2. Struts in a Simple Web Application
- Stars Information Application
- List Stars Flow
- Display Star Flow
- ActionServlet: the Controller
- struts-config.xml
- ActionForm: Form State
- The execute Method of StarsListAction
- The execute Method of StarsDisplayAction
- Directing Processing Flow with an ActionForward
- Building a View with Tags
- Review: Flow through a Typical Struts-Based Application

### 3. The Controller
- ActionServlet as a Controller
- RequestProcessor
- Developer Responsibilities
- Mapping
- Forwards
- Lifecycle of an ActionForm

### 4. Action and the Business Model
- The execute Method of Action
- execute() Method Considerations
- Handling an Error
- Threading Considerations
- Some Best Practices for Action
- More Best Practices for Action

### 5. The View
- Forwarding to a View
- Overview of Struts Tags
- Struts HTML Tags
- Form-Related Tags
- Dealing with URLs
- Using Error Tags
- Displaying Messages
- Struts Bean Tags
- Struts Logic Tags
- Some Struts View Best Practices

### 6. Internationalization
- I18N and L10N
- Resource Bundles
- Java's MessageFormat Class
- Internationalization in Struts
- I18N with Struts Tags
- I18N with JSTL tags
- I18N within Java Code
7. **Advanced Struts Features**
   - Accessing Bean Properties
   - DynaActionForm: A Configurable Form
   - Indexed and Mapped Properties in a Form
     - Using `indexed="true"`
   - Preventing Duplicate Form Submits
   - Using ForwardAction and IncludeAction
   - DispatchAction
   - LookupDispatchAction
   - Implementing a LookupDispatchAction

8. **Handling Errors**
   - Error Handling Options with Struts
   - Documenting Errors with `ActionMessage`
   - JSP Error Pages
   - Declarative Java Exception Handling
   - Logging in Struts

9. **Validation**
   - Validator Overview
   - Validator Requirements
   - Configuring Validator Rules
   - Struts Validators
   - Configuring the Struts Validators
   - Configuring Form Validation — global and formset
   - Configuring Form Validation — form and field
   - Configuring Form Validation — arg
   - Configuring Form Validation — var
   - Validation with Regular Expressions
   - `ValidatorForm verses ValidatorActionForm`
   - Implementing a Validator Method
   - Other Validator Implications

10. **Page Composition with Tiles**
    - Tiles Overview
    - Building a Tiles Template
    - Basic Tiles Example
    - Tiles Definitions
    - Additional Options with Definitions
    - Placing Definitions in a Configuration File
    - Using the `<put>` Tag
    - Enabling the Tiles Plug-In
    - Using Tiles

11. **Appendix - Nested Tags**
    - Why Nested Tags?
    - Using Nested Tags
    - Parent and Root Tags