

## Advanced J2EE and SEAM Developments using Eclipse, IDE, and JBOSS Website Course Outline

### I. Object Technology Basics

- A. Objects in the real world
- B. Attributes of an Object
- C. Behavior of an Object
- D. Identity of an Object
- E. What can we do with real world objects?
- F. What is an Object in programming world?
- G. Concept of Data Types
- H. Classes and Interfaces
- I. Create Objects from Data Types
- J. Unified Modeling Language (UML)
- K. Object Based Programming
- L. Object Oriented Programming
- M. Encapsulation
- N. Inheritance
- O. Aggregation
- P. Composition

### II. Java Programming Basics

- A. What is Java?
- B. Java Development Kit (JDK)
- C. Java API
- D. Java Compilation Model
- E. Java Runtime Environment (JRE)
- F. Types of Java Programs
- G. Java Applications
- H. Java Applets

### III. Eclipse IDE

- A. What is Eclipse?
- B. Eclipse Workbench and Plugins
- C. Eclipse SDK
- D. Eclipse WTP
- E. Perspectives, Views and Editors
- F. Java Perspective
- G. Debug Perspective
- H. J2EE Perspective

### IV. Java Language Fundamentals

- A. Lexical Structure
- B. Variables in Java
- C. Primitive Or Built-in Data Types
- D. Primitive variables
- E. Object variables
- F. Operators
- G. Expressions
- H. Strings
- I. Branching and Loops – if, if/else, for, while, do/while
- J. Arrays
- K. Arrays of objects
- L. Multithreading
- M. Garbage Collection

### V. Classes and Objects

- A. Structure of a Class
- B. Instance variables and instance methods
- C. Class variables and Class methods
- D. Constructor methods
- E. Naming Conventions
- F. Creating Objects from classes
- G. Method Overloading
- H. Constructor Overloading

### VI. Advanced Class Concepts

- A. Concept of Inheritance
- B. Java Syntax for Class inheritance
- C. Method Overriding
- D. Java Syntax for Aggregation
- E. What is a concrete Class?
- F. What is an abstract class?
- G. Example of an abstract class
- H. What is an Interface?
- I. Defining a Java interface
- J. Writing an Implementation class for the interface
- K. Polymorphism
- L. Illustration of Polymorphism in Java
- M. Type Casting

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**VII. Access Control and Modifiers**

- A. Concept of Packages in Java
- B. How to create a package?
- C. Importing packages
- D. CLASSPATH setting
- E. Visibility (Access Control) modifiers
- F. Class modifiers
- G. Field modifiers
- H. Method modifiers
- I. Constructor modifiers
- J. Access Control Illustration

**VIII. Exception Handling**

- A. Error Handling Overview
- B. Error Handling in Java
- C. Errors
- D. Exceptions
- E. try –catch mechanism
- F. try-catch-finally mechanism
- G. Multiple catch blocks
- H. Using the keyword throw and throws
- I. Passing the Responsibility to the caller
- J. Defining Custom Exceptions

**IX. Using Java 2 API – Basics & I/O**

- A. java.lang package
- B. Wrapper Classes
- C. java.io package
- D. Input and Output streams
- E. Input and Output readers
- F. Reading from Keyboard
- G. Reading from file
- H. Writing to a file
- I. java.sql package
- J. JDBC Overview
- K. JDBC Objects
- L. Database Access and Operations

**X. Enterprise Java Basics**

- A. Client-Server Overview
- B. Enterprise Java (J2EE) Runtime
- C. Enterprise Java (J2EE) Application
- D. Enterprise Java Services
- E. Enterprise Java Communication Technologies
- F. XML based Configuration
- G. Web Services Technologies
- H. J2EE Application Architecture
- I. Enterprise Java Web Application
- J. Web Components
- K. Web Module Deployment Descriptors
- L. EJB Components
- M. EJB Module Deployment Descriptors
- N. Packaging Web, EJB and J2EE Applications

**XI. JBOSS Application Server**

- A. JBOSS Application Server
- B. Installing JBOSS
- C. Command-Line Installation
- D. JBOSS AS Directory Structure
- E. JBOSS Server Configuration Directory Structure
- F. The default server Configuration Files
- G. JBOSS Architecture Overview
- H. The TOMCAT service
- I. The server.xml configuration

**XII. Servlets Development and Configuration**

- A. Servlets and Web Servers
- B. The Servlet API
- C. Servlet Life-cycle
- D. HTTP Servlets Development
- E. HTTP Servlets methods
- F. Servlet Initialization Parameters
- G. Getting Input Parameters from user
- H. Http Session State
- I. Cookies
- J. URL Rewriting
- K. Configuring Servlets
- L. Using Filters

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**XIII. Java Server Pages (JSP) Development**

- A. JSP Basic Tags
- B. JSP Declarations and Expressions
- C. JSP Scriptlets
- D. JSP Implicit Objects
- E. JSP Compilation
- F. JSP Lifecycle
- G. JSP Advanced Tags
- H. Java beans and JSP
- I. JSP Custom Tags
- J. Configuring JSP
- K. Configuring Custom JSP tags
- L. Tag Library Descriptor
- M. JSP Expression Language (EL)
- N. JSP API
- O. Java Server Faces Tags
- P. JSTL custom Tags

**XIV. Java Server Faces (JSF)**

- A. Java Server Faces Architecture
- B. Controller – Faces Servlet
- C. Managed Beans
- D. The faces-config.xml
- E. Expression Language
- F. JSF Custom Tags
- G. User Interface Tags
- H. JSF Application Lifecycle
- I. Validators
- J. Using Tag Libraries

**XV. EJB 3.0 Basics**

- A. EJB 3.0 Overview
- B. Using POJO Strategy
- C. EJB Annotations
- D. Stateless Session Beans
- E. Stateful Session Beans
- F. Entity Beans
- G. Best Practices

**XVI. JBOSS SEAM Basics**

- A. What is SEAM?
- B. SEAM Application Framework Features
- C. Set up Eclipse SEAM Project
- D. Creating a Form with an Action
- E. Generating an application from Database
- F. Deploying SEAM application

**XV. SEAM Contexts and Components**

- A. SEAM Contextual Component Model
- B. SEAM Contexts
- C. Context variables
- D. Context Search Priority
- E. SEAM Components
- F. SEAM Components for EJB 3.0 Beans
- G. SEAM Java Beans Components
- H. Built-in Components
- I. Bijection
- J. Lifecycle Methods
- K. The Mutable interface
- L. Factory and Manager Components
- M. Configuring SEAM Components (components.xml)

**XVI. SEAM Application Framework**

- A. Using JSF with SEAM
- B. JSF Form Validation in SEAM
- C. SEAM JSF Controls
- D. SEAM Objects
- E. Home Objects
- F. Query Objects
- G. Controller Objects
- H. SEAM support for JPA
- I. SEAM support for Hibernate
- J. Using EL
- K. Configuring SEAM application
- L. Integrating SEAM with JSF and Servlet Container
- M. Integrating SEAM with EJB Container
- N. Packaging SEAM Applications
- O. Testing SEAM Applications

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**XV. J2EE Design Patterns**

- A. Model-View-Controller Pattern
- B. Front Controller
- C. View Patterns
- D. Business Delegate Pattern
- E. Service Locator
- F. Session Facade
- G. Composite Entity
- H. Data Access Objects

**XVI. Topics of Client Focus**