



# ENTERPRISE JAVABEANS: STUDENT GUIDE TABLE OF CONTENTS

Course Description .....	viii
ProsoftTraining Courseware .....	viii
Course Objectives .....	x
Classroom Setup .....	x
System Requirements .....	x
Conventions and Graphics Used in This Book .....	xii

**Lesson 1: Introduction to Server-Side Component Software** **1-1**

Pre-Assessment Questions .....	1-2
Introduction .....	1-3
Client-Server and Multi-Tiered Architectures .....	1-3
Software Components .....	1-5
Component Architecture Solutions .....	1-6
J2EE Technologies .....	1-8
Enterprise JavaBeans .....	1-10
Lesson 1 Review .....	1-14

**Lesson 2: Overview of the Enterprise JavaBeans Framework** **2-1**

Pre-Assessment Questions .....	2-2
Introduction to Enterprise JavaBeans .....	2-3
EJB Architecture .....	2-3
Client Interaction with Enterprise JavaBeans .....	2-4
EJB Container Services .....	2-5
The EJB Home Object .....	2-6
The EJB Object .....	2-6
Types of Enterprise JavaBeans .....	2-7
Deployment Descriptors .....	2-9
The EJB-JAR File .....	2-9
Lesson 2 Review .....	2-11

**Lesson 3: Creating Session Beans** **3-1**

Pre-Assessment Questions .....	3-2
Introduction to Session Beans .....	3-3
Creating the Enterprise Bean Class .....	3-3
Stateless and Stateful Session Beans .....	3-7
Writing Business Methods for an Enterprise Bean .....	3-9
The Home Interface .....	3-10
The EJB Object .....	3-11
Exceptions in EJB .....	3-12
Example: A Session Bean .....	3-22

The Library Application .....	3-24
Introduction to EJB Deployment.....	3-25
The Deployment Descriptor .....	3-25
Environment Data .....	3-27
Using Bean References .....	3-29
Using Resource Factories.....	3-31
Assembler/Deployer Roles with the Deployment Descriptor .....	3-33
EJB Deployment in an EJB Server.....	3-33
Lesson 3 Review .....	3-46

**Lesson 4: Entity Beans** **4-1**

Pre-Assessment Questions.....	4-2
Introduction to Entity Enterprise Beans.....	4-3
What Is an Entity Bean?.....	4-3
Primary Keys .....	4-5
Entity Bean Architecture .....	4-5
Bean-Managed Persistence .....	4-8
Entity Bean Methods .....	4-10
Using Finder Methods.....	4-15
The Remote Interface .....	4-18
The Home Interface .....	4-18
Lesson 4 Review .....	4-28

**Lesson 5: Enterprise JavaBeans Clients** **5-1**

Pre-Assessment Questions.....	5-2
Introduction to EJB Clients .....	5-3
Using JNDI.....	5-3
Creating an EJB Instance .....	5-5
Removing the Enterprise Bean.....	5-5
Client Sample.....	5-5
Lesson 5 Review .....	5-11

**Lesson 6: Container-Managed Persistence** **6-1**

Pre-Assessment Questions.....	6-2
Introduction to Container-Managed Persistence.....	6-3
The Primary Key .....	6-4
EJB Methods and CMP.....	6-4
The Deployment Descriptor and CMP.....	6-6
Example: A CMP Entity Bean.....	6-7
Lesson 6 Review .....	6-12

**Lesson 7: Transactions in Enterprise JavaBeans** **7-1**

Pre-Assessment Questions.....	7-2
Introduction to Transactions .....	7-3
What Are Transactions?.....	7-3
Participants in Transactions .....	7-4
Properties of Transactions .....	7-4
EJB Transactional Models .....	7-5
Distributed Transactions .....	7-7
Isolation Levels.....	7-7
Transactions in EJB .....	7-8

Container-Managed Transactions (CMT) .....	7-8
Bean-Managed Transactions (BMT).....	7-13
Lesson 7 Review .....	7-18

**Lesson 8: Enterprise JavaBeans Security 8-1**

Pre-Assessment Questions.....	8-2
Introduction to EJB Security .....	8-3
Defining Users, Principals and Roles.....	8-3
Security and the Deployment Descriptor.....	8-5
Lesson 8 Review .....	8-11

**Appendixes Appendixes-1**

**Glossary Glossary-1**

**Index Index-1**

**Supplemental CD-ROM Contents Supplemental CD-ROM Contents-1**

**List of Labs**

Lab 3-1: Deploying and connecting to an Enterprise JavaBean .....	3-12
Lab 3-2: Creating and deploying session beans.....	3-34
Lab 4-1: Creating entity beans.....	4-23
Lab 5-1: Writing a CheckOut client for the Library application.....	5-7
Lab 5-2: Creating a CheckIn client for the Library application.....	5-9
Lab 6-1: Creating a container-managed persistence bean .....	6-9

**List of Figures**

Figure 1-1: Centralized mainframe architecture .....	1-3
Figure 1-2: Two-tier architecture .....	1-4
Figure 1-3: Three-tier architecture.....	1-4
Figure 1-4: J2EE architecture.....	1-9
Figure 2-1: EJB architecture .....	2-3
Figure 2-2: Client interaction with enterprise bean .....	2-4
Figure 2-3: Communication between stub and skeleton.....	2-7
Figure 2-4: Entity beans provide views to underlying data stores .....	2-8
Figure 3-1: EJB container creates stateless session bean.....	3-8
Figure 3-2: EJB container creates stateful session bean .....	3-9
Figure 3-3: Application Deployment Tool window .....	3-14
Figure 3-4: New Application dialog box .....	3-14
Figure 3-5: Modified Application Deployment Tool window.....	3-15
Figure 3-6: New Enterprise Bean Wizard.....	3-15
Figure 3-7: Add Files to .JAR dialog box.....	3-16
Figure 3-8: Modified New Enterprise Bean Wizard.....	3-17
Figure 3-9: New Enterprise Bean Wizard options .....	3-17
Figure 3-10: Application Deployment Tool: HelloWorld.....	3-18
Figure 3-11: Verify Specification Compliance window.....	3-19
Figure 3-12: Deploy Wizard .....	3-19
Figure 3-13: Modified Deploy Wizard .....	3-20
Figure 3-14: Deployment Progress window.....	3-20
Figure 3-15: Application Deployment Tool after bean deployment .....	3-21
Figure 3-16: LibraryDB schema.....	3-24

Figure 3-17: EJB looks up environment property .....	3-28
Figure 3-18: Accessing a factory resource .....	3-31
Figure 3-19: New Application dialog box .....	3-35
Figure 3-20: Add Files to .JAR dialog box.....	3-36
Figure 3-21: Entity Settings screen.....	3-37
Figure 3-22: Resource References .....	3-38
Figure 3-23: Transaction Management.....	3-39
Figure 3-24: Adding a JNDI name.....	3-40
Figure 3-25: Enterprise Bean References .....	3-41
Figure 3-26: Deploy Library dialog box.....	3-42
Figure 3-27: Deployment Progress window.....	3-43
Figure 3-28: Application Deployment Tool after deployment of Library application .....	3-43
Figure 4-1: Entity bean creation .....	4-6
Figure 4-2: Life cycle of an entity bean instance.....	4-8
Figure 4-3: Using a resource factory to connect to a database.....	4-10
Figure 6-1: Deployment Settings dialog box .....	6-10
Figure 7-1: Flat transactional model .....	7-5
Figure 7-2: Nested transactional model.....	7-6
Figure 7-3: Transaction Management screen in New Enterprise Bean Wizard .....	7-12
Figure 7-4: Transaction Management pane in Application Deployment Tool .....	7-12
Figure 8-1: Users, principals and roles .....	8-3
Figure 8-2: Security tab.....	8-8
Figure 8-3: Editing Roles dialog box.....	8-8
Figure 8-4: Adding roles at the JAR level.....	8-9
Figure 8-5: Adding permissions at the method level .....	8-9

### List of Tables

Table 1-1: J2EE services.....	1-9
Table 1-2: JavaBeans and Enterprise JavaBeans .....	1-11
Table 3-1: Main DD XML tags .....	3-26
Table 3-2: Environment property XML tags .....	3-28
Table 3-3: EJB reference XML tags .....	3-30
Table 3-4: Factory resource reference XML tags .....	3-32
Table 7-1: UserTransaction interface properties .....	7-14
Table 7-2: UserTransaction interface methods .....	7-14
Table 8-1: Security DD XML tags .....	8-5

### Appendixes

Appendix A:	Objectives and Locations*
Appendix B:	EJB References and Tools*
Appendix C:	Works Consulted*

\* Appendix found on Supplemental CD-ROM