



Module Presenter's Manual *for* **Enterprise Application Development (EJB)**

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Amendment Record

Version No.	Effective Date	Change	Replaced Pages
1.0	September 2017	New	-

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1. Introduction

At the end of this course, students will be able to:

- Explain business-tier functionality using EJB technology
- Deploy EJB technology business-tier components on an application server
- Integrate an EJB technology-based application using the Java Messaging Service API
- Create and implement timer-based services
- Understand Java Persistence API.
- Understand Entity Manager and Entity Relationships.
- Explain JSP and develop JSP pages.
- Understand Java Persistence API Query Language
- Integrate transactions and security into an enterprise application

2. Information on Session Allocation

Module	Online (No. of Hrs)
Enterprise Application Development	40

Throughout this Presenter's Manual, the module **Enterprise Application Development** will be referred to as **EJB**.








3. Module Deliverables available on OnlineVarsity



To aid the learning process, following are the deliverables

Student Deliverables:

1. Learner's Guide (eBook)

Resources available on OnlineVarsity for Students:

Icons	Feature - Description/Functionality
	Download Book - Student has the option to download the subject related e-book and read offline.
	Glossary - Student can access a list of subject related specialized words with their definitions.
	FAQ - Student can access frequently asked questions and their answers.
	Show Me How - Student can view a step-wise simulation/demonstration of the module related topics.
	Practice 4 Me - Student can test and evaluate their understanding of module related topics.
	Work Assignments - Student can solve scenario based lab assignments (Hands-on). The faculty will evaluate and give their feedbacks.
	References - Student can access additional subject related material for reading.

	Feedback - Student can provide feedback on the course material.
	Ask to Learn – Student can submit subject related technical queries. Queries submitted will be directed to the particular course coordinator/head.

4. Week-wise Session Schedule

- A Session has duration of 2 hours.

➤ Week-Wise Schedule

Week	Day 1	Day 2	Day 3	Day 4
1	Session 1 EJB- TL1	Session 2 EJB- TL2	Session 3 EJB- TL3	Session 4 EJB- TL4
2	Session 5 EJB- TL5	Session 6 EJB- TL6	Session 7 EJB- TL7	Session 8 EJB- TL8
3	Session 9 EJB- TL9	Session 10 EJB- TL10	Session 11 EJB- TL11	Session 12 EJB- TL12
4	Session 13 EJB- TL13	Session 14 EJB- TL14	Session 15 EJB- TL15	Session 16 EJB- TL16
5	Session 17 EJB- TL17	Session 18 EJB- TL18	Session 19 EJB- TL19	Session 20 EJB- TL20

EJB: Enterprise Application Development

TL: Online Session

5. Session Coverage

Session No.	Session Title	Session Details	Deliverables' Mapping
1	EJB- TL1	<p>All the topics as listed below from Session 1 and Session 2 of <i>Enterprise Application Development in Java EE</i> book should be covered in this session.</p> <p><u>Session 1 – Introduction to Business Components</u></p> <ul style="list-style-type: none"> ➤ Explain enterprise applications ➤ Describe the problem faced by large enterprise applications ➤ Explain distributed application architecture used for developing business components ➤ Describe Java EE platform and its API ➤ Describe application development architecture of enterprise application ➤ Describe application server containers and their services ➤ List various Java EE application servers ➤ Describe Java EE profiles and the use of EJBLite on application servers <p><u>Session 2 – Enterprise JavaBeans</u></p> <ul style="list-style-type: none"> ➤ Describe the principles of component-based development ➤ Define Enterprise JavaBeans ➤ List the characteristics of enterprise JavaBeans ➤ Describe the evolution of enterprise JavaBeans ➤ Explain the features of EJB 3.0 ➤ Explain the different types of Enterprise JavaBeans ➤ Explain the JNDI service on 	<p><u>Enterprise Application Development in Java EE</u></p> <p>SG - Session 1 & 2 XP - Session 1 & 2 TG - Session 1 & 2</p>

		<p>Java EE platform</p> <ul style="list-style-type: none"> ➤ Explain JNDI APIs ➤ Describe the various roles involved in EJB application development ➤ Explain the various steps involved in developing and packaging an enterprise application ➤ Describe tools used for developing enterprise application 	
2	EJB- TL2	<p>The workshop lessons of Session 2 of <i>Enterprise Application Development in Java EE</i> course should be covered in this session.</p>	<p><u>Enterprise Application Development in Java EE</u></p> <p>(OnlineVarsity)</p> <p>Session 2</p>
	EJB- TL3	<p>All the topics as listed below from Session 3 and Session 4 of <i>Enterprise Application Development in Java EE</i> book should be covered in this session.</p> <p><u>Session 3 – Session Beans</u></p> <ul style="list-style-type: none"> ➤ Describe Session beans ➤ Describe the characteristics of Session bean ➤ List the different types of Session beans ➤ Explain Stateless Session beans ➤ Describe the lifecycle of Stateless Session beans ➤ Explain the process for developing a Stateless Session bean in NetBeans IDE ➤ Describe the types of communication with Session beans ➤ Explain asynchronous communication in Stateless Session bean <p><u>Session 4 – Stateful Session Beans</u></p>	<p><u>Enterprise Application Development in Java EE</u></p> <p>SG - Session 3 & 4 XP - Session 3 & 4 TG - Session 3 & 4</p>

		<ul style="list-style-type: none"> ➤ Explain the working of Stateful Session beans ➤ Explain the different elements of Stateful Session beans ➤ Describe the lifecycle of Stateful Session beans and associated callback methods ➤ Explain the Implementation of Stateful Session beans ➤ Explain the different types of clients accessing Stateful Session bean ➤ Explain exception handling in session beans 	
4	EJB- TL4	The workshop lessons of Session 3 and Session 4 of <i>Enterprise Application Development in Java EE</i> course should be covered in this session.	<p><u>Enterprise Application Development in Java EE</u></p> <p>(OnlineVarsity)</p> <p>Session 3 Session 4</p>
5	EJB- TL5	<p>All the topics as listed below from Session 5 and Session 6 of <i>Enterprise Application Development in Java EE</i> book should be covered in this session.</p> <p><u>Session 5 – Singleton Session Beans</u></p> <ul style="list-style-type: none"> ➤ Explain the need of Singleton Session bean ➤ Describe the characteristics of Singleton Session bean ➤ Describe the various stages in the lifecycle of Singleton Session bean ➤ Explain Singleton Session bean specification and its initialization strategies ➤ Describe how to achieve concurrency access to Singleton Session bean ➤ Explain container-managed concurrent access to Singleton Session bean 	<p><u>Enterprise Application Development in Java EE</u></p> <p>SG - Session 5 & 6 XP - Session 5 & 6 TG - Session 5 & 6</p>

		<ul style="list-style-type: none"> ➤ Explain bean-managed concurrent access to Singleton Session bean ➤ Explain the mechanism to configure access time out in concurrency ➤ Explain how to implement Singleton Session bean in an enterprise application <p><u>Session 6 – Introduction to Messaging</u></p> <ul style="list-style-type: none"> ➤ Describe the messaging concept and its architecture ➤ Describe Java Messaging Service API ➤ Describe various messaging models supported by JMS ➤ Explain the working of Message-driven beans ➤ Describe how to create and configure a Message-driven bean in Java EE application 	
6	EJB– TL6	<p>The workshop lessons of Session 5 and Session 6 of <i>Enterprise Application Development in Java EE</i> course should be covered in this session.</p>	<p><u>Enterprise Application Development in Java EE</u></p> <p><u>(OnlineVarsity)</u></p> <p>Session 5 Session 6</p>
7	EJB– TL7	<p>All the topics as listed below from Session 7 and Session 8 of <i>Enterprise Application Development in Java EE</i> book should be covered in this session.</p> <p><u>Session 7 – Interceptors and Dependency Injection</u></p> <ul style="list-style-type: none"> ➤ Explain aspect-oriented programming ➤ List the advantages of aspect-oriented programming ➤ Explain interceptors and their 	<p><u>Enterprise Application Development in Java EE</u></p> <p>SG - Session 7 & 8 XP - Session 7 & 8 TG - Session 7 & 8</p>

		<p>usage in enterprise applications</p> <ul style="list-style-type: none"> ➤ Describe the different types of interceptor methods ➤ Explain how to define the interceptors and their levels of description ➤ Explain the creation of interceptor class ➤ Explain how to implement business method and lifecycle callback method interceptors ➤ Describe various aspects of context dependency and Injection ➤ Describe how to use CDI in enterprise applications <p><u>Session 8 – Transactions</u></p> <ul style="list-style-type: none"> ➤ Explain the concept of transactions ➤ Define various properties of transactions ➤ Explain Java Transaction API (JTA) ➤ Describe the interfaces of JTA that can be used in the enterprise applications ➤ Explain programmatic versus Declarative demarcation ➤ Explain container-managed transaction ➤ Explain bean-managed transaction ➤ Explain how to manage transactions in messaging 	
8	EJB– TL8	The workshop lessons of Session 7 and Session 8 of <i>Enterprise Application Development in Java EE</i> course should be covered in this session.	<p><u>Enterprise Application Development in Java EE</u></p> <p>(OnlineVarsity)</p> <p>Session 7 Session 8</p>
9	EJB– TL9	All the topics as listed below from Session 9 of <i>Enterprise Application</i>	<u>Enterprise Application</u>

		<p><i>Development in Java EE book</i> should be covered in this session.</p> <p><u>Session 9 – Persistence of Entities</u></p> <ul style="list-style-type: none"> ➤ Understand how to use JDBC API for persisting data ➤ Explain Object Relational Mapping (ORM) ➤ Describe the ORM tools used for performing data persistence ➤ Explain Java Persistence API (JPA) ➤ Describe Entities and Entity Manager in JPA ➤ Understand how to manage entities using JPA ➤ Understand how persistent objects are mapped onto the database 	<p><u>Development in Java EE</u></p> <p>SG - Session 9 XP - Session 9 TG - Session 9</p>
10	EJB-TL10	<p>The workshop lessons of Session 9 of <i>Enterprise Application Development in Java EE course</i> should be covered in this session.</p>	<p><u>Enterprise Application Development in Java EE</u></p> <p>(OnlineVarsity)</p> <p>Session 9</p>
11	EJB-TL11	<p>All the topics as listed below from Session 10 of <i>Enterprise Application Development in Java EE book</i> should be covered in this session.</p> <p><u>Session 10 – Advanced Persistence Concepts</u></p> <ul style="list-style-type: none"> ➤ Explain how relationships are managed in OOP ➤ Explain how relationships are managed in relational databases ➤ Explain cardinality and directionality in object relationships ➤ Explain how relationships are managed in JPA 	<p><u>Enterprise Application Development in Java EE</u></p> <p>SG - Session 10 XP - Session 10 TG - Session 10</p>

		<ul style="list-style-type: none"> ➤ Describe annotations provided by JPA to create object relationships ➤ Describe the mapping of different aspects of database to the enterprise application ➤ Describe the different JPA strategies to map inheritance in relational databases ➤ Explain implementation of inheritance among the entities 	
12	EJB-TL12	The workshop lessons of Session 10 of <i>Enterprise Application Development in Java EE</i> course should be covered in this session.	<p><u>Enterprise Application Development in Java EE</u></p> <p>(OnlineVarsity)</p> <p>Session 10</p>
13	EJB-TL13	<p>All the topics as listed below from Session 11 of <i>Enterprise Application Development in Java EE</i> book should be covered in this session.</p> <p><u>Session 11 – Query and Criteria API</u></p> <ul style="list-style-type: none"> ➤ Explain Java Persistence Query Language (JPQL) ➤ List the characteristics of JPQL ➤ Explain Query and TypedQuery API ➤ Explain how to write the named queries in JPQL ➤ Explain how to execute the named queries in JPQL ➤ Explain the methods to tune the JPQL query results ➤ Explain polymorphic queries ➤ Explain Criteria API ➤ Explain how to develop queries using Criteria API ➤ Explain how to manage Criteria query results ➤ Explain Metamodel API 	<p><u>Enterprise Application Development in Java EE</u></p> <p>SG - Session 11 XP - Session 11 TG - Session 11</p>

14	EJB-TL14	The workshop lessons of Session 11 of <i>Enterprise Application Development in Java EE</i> course should be covered in this session.	<u>Enterprise Application Development in Java EE</u> <u>(OnlineVarsity)</u> Session 11
15	EJB-TL15	All the topics as listed below from Session 12 of <i>Enterprise Application Development in Java EE</i> book should be covered in this session. <u>Session 12 – Concurrency, Listeners, and Caching</u> <ul style="list-style-type: none"> ➤ Describe concurrency utilities provided by Java EE ➤ Explain locking techniques used to enable concurrency in entities ➤ Describe different locking modes ➤ Explain entity lifecycle callback events ➤ Explain how to inject external listeners to handle lifecycle callback events ➤ Explain caching techniques ➤ Explain how to specify caching modes in applications 	<u>Enterprise Application Development in Java EE</u> SG - Session 12 XP - Session 12 TG - Session 12
16	EJB-TL16	All the topics as listed below from Session 13 of <i>Enterprise Application Development in Java EE</i> book should be covered in this session. <u>Session 13 – Security</u> <ul style="list-style-type: none"> ➤ Describe enterprise application security ➤ Explain how to implement security at various levels in an application ➤ Explain how roles, users, and user groups are defined in an application 	<u>Enterprise Application Development in Java EE</u> SG - Session 13 XP - Session 13 TG - Session 13

		<ul style="list-style-type: none"> ➤ Define authorization and authentication mechanisms used in enterprise applications ➤ Explain JASS architecture and its services ➤ Explain how to secure application clients 	
17	EJB-TL17	The workshop lessons of Session 12 and Session 13 of <i>Enterprise Application Development in Java EE</i> course should be covered in this session.	<p><u>Enterprise Application Development in Java EE</u></p> <p><u>(OnlineVarsity)</u></p> <p>Session 12 & 13</p>
18	EJB-TL18	<p>All the topics as listed below from Session 14 of <i>Enterprise Application Development in Java EE</i> book should be covered in this session.</p> <p><u>Session 14 – EJB Timer Service</u></p> <ul style="list-style-type: none"> ➤ Describe how to use a timer in an enterprise application ➤ Explain the different types of timers in EJB ➤ Describe how to handle timers in an application ➤ Describe annotations associated with timers ➤ Describe operations performed on Timer objects 	<p><u>Enterprise Application Development in Java EE</u></p> <p>SG - Session 14 XP - Session 14 TG - Session 14</p>
19	EJB-TL19	<p>All the topics as listed below from Session 15 of <i>Enterprise Application Development in Java EE</i> book should be covered in this session.</p> <p><u>Session 15 – EJB Design Patterns</u></p> <ul style="list-style-type: none"> ➤ Describe design patterns ➤ Explain different types of design patterns ➤ Explain mostly commonly used Java EE design patterns 	<p><u>Enterprise Application Development in Java EE</u></p> <p>SG - Session 15 XP - Session 15 TG - Session 15</p>

		➤ Describe best practices in selecting EJB component in the enterprise applications	
20	EJB-TL20	The workshop lessons of Session 14 and Session 15 of <i>Enterprise Application Development in Java EE</i> course should be covered in this session.	<u>Enterprise Application Development in Java EE</u> <u>(OnlineVarsity)</u> Session 15

6. Library References

➤ Enterprise JavaBeans 3.1 , 6th Edition by Andrew Lee Rubinger, Bill Burke
➤ EJB 3.1 Cookbook Paperback by Richard M. Reese
➤ EJB 3 in Action by Debu Panda, Reza Rahman, and Derek Lane

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