Aptech

Unleash your potential

Module
Presenter's Manual

for

Application Development Fundamentals-II

Effective From: April 2017
Ver. 1.0

Amendment Record

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

Table of Contents

1. Introduction

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

➢ Create Java technology applications that leverage the object-oriented features of the Java language, such as encapsulation, inheritance, and polymorphism
➢ Execute a Java application from the command line
➢ Create applications that use the Collections framework
➢ Implement error-handling techniques using exception handling
➢ Implement input/output (I/O) functionality to read from and write to data and text files and understand advanced I/O streams.
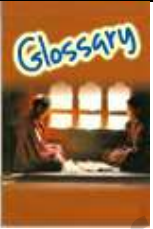
2. Information on Session Allocation

Module	Online (No. of Hrs)
JAVA-II	**36**

JAVA-II – Application Development Fundamentals-II

3. Module Deliverables available on OnlineVarsity

To aid the learning process, following are the deliverables

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 hrs**
- **The Concepts session is to be conducted in the classroom**
- **Lab session is to be conducted in the lab**

➢ **Week-Wise Schedule**

Week	Day 1	Day 2	Day 3	Day 4
1	**Session 1 JAVA-II – TL1**	**Session 2 JAVA-II –TL2**	**Session 3 JAVA-II – TL3**	**Session 4 JAVA-II – TL4**
2	**Session 5 JAVA-II – TL5**	**Session 6 JAVA-II – TL6**	**Session 7 JAVA-II – TL7**	**Session 8 JAVA-II – TL8**
3	**Session 9 JAVA-II – TL9**	**Session 10 JAVA-II – TL10**	**Session 11 JAVA-II – TL11**	**Session 12 JAVA-II – TL12**
4	**Session 13 JAVA-II – TL13**	**Session 14 JAVA-II – TL14**	**Session 15 JAVA-II – TL15**	**Session 16 JAVA-II – TL16**
5	**Session 17 JAVA-II – TL18**	**Session 18 JAVA-II –TL18**		

JAVA-II: Application Development Fundamentals-II
TL: Online Session

5. Session Coverage

Session No.	Session Title	Session Details	Deliverables' Mapping
1	**OOPJVA – TL1**	All the topics as listed below from Session 1 and Session 2of *Professional Programming in Java* book should be covered in this session. **Session 1 – Exceptions and Assertions** ➢ Describe exceptions ➢ Explain the use of try-catch-finally blocks ➢ Explain throwing and handling exceptions ➢ Explain handling multiple exceptions in a single catch block ➢ Explain the use of try-with-resources ➢ Describe creation and use of custom exceptions ➢ Explain assertions and its types **Session 2 – java.lang Package** ➢ Describe the java.lang package ➢ Explain the various classes of java.lang package ➢ Explain how to use and manipulate Strings ➢ Explain regular expressions, pattern, and matcher ➢ Explain String literal and Character classes ➢ Explain the use of quantifiers, capturing groups, and boundary matchers	**Professional Programming in Java** SG - Session 1 & 2 XP - Session 1 & 2 TG – Session 1 & 2
2	**OOPJVA – TL2**	All the topics as listed below from Session 3 and Session 4 of *Professional Programming in Java* book should be covered in this session. **Session 3 – Collections API**	**Professional Programming in Java** SG - Session 3 & 4 XP - Session 3 & 4 TG – Session 3 & 4

Session No.	Session Title	Session Details	Deliverables' Mapping
		➤ Explain java.util package ➤ Explain List classes and interfaces ➤ Explain Set classes and interfaces ➤ Explain Map classes and interfaces ➤ Explain Queues and Arrays **Session 4 – Generics** ➤ Identify the need for Generics ➤ List the advantages and limitations of Generics ➤ Explain generic class declaration and instantiation ➤ Define and describe generic methods ➤ Describe the relationship between Collection and Generics ➤ Explain the wildcard argument ➤ Describe the use of inheritance with Generics ➤ Describe the use of legacy code in Generics and Generics in legacy code ➤ Explain type inference	
3	**OOPJVA – TL3**	The workshop lessons of Session 1 to Session 4 of *Professional Programming in Java* course should be covered in this session.	**Professional Programming in Java** Session 1, 2, 3, & 4
4	**OOPJVA – TL4**	All the topics as listed below from Session 5 and Session 6 of *Professional Programming in Java* book should be covered in this session. **Session 5 – File Handling in Java** ➤ Define data streams ➤ Identify the need for streams ➤ Identify the purpose of the File class, its constructors, and	**Professional Programming in Java** SG - Session 5 & 6 XP - Session 5 & 6 TG – Session 5 & 6

Session No.	Session Title	Session Details	Deliverables' Mapping
		methods ➤ Describe the DataInput and DataOutput interfaces ➤ Describe the byte stream and charcater stream in the java.io.package ➤ Explain the InputStream and OutputStream classes ➤ Describe the BufferedInputStream and BufferedOutputStream classes ➤ Describe Character stream classes ➤ Describe the chaining of I/O systems ➤ Define Serialization and describe the need and purpose of Serialization **Session 6 – New Features in File Handling** ➤ Describe the Console class ➤ Explain the DeflaterInputStream class ➤ Explain the InflaterOutputStream class ➤ Describe the java.nio package ➤ Describe the file system	
5	**OOPJVA – TL5**	All the topics as listed below from Session 7 and Session 8 of *Professional Programming in Java* book should be covered in this session. **Session 7 – Introduction to Threads** ➤ Create Threads in Java ➤ Manage Threads ➤ Explain Daemon Threads **Session 8 – Multithreading and Concurrency** ➤ Define multithreading	**Professional Programming in Java** SG – Session 7 & 8 XP - Session 7 & 8 TG – Session 7 & 8

Session No.	Session Title	Session Details	Deliverables' Mapping
		➢ Differentiate between multithreading and multitasking ➢ Explain the use of isAlive() and join() method ➢ Explain race conditions and ways to overcome them ➢ Describe intrinsic lock and synchronization ➢ Describe atomic access ➢ Describe the use of wait() and notify() methods ➢ Define deadlock and describe the ways to overcome deadlock ➢ Explain java.util.concurrent collections	
6	**OOPJVA – TL6**	The workshop lessons of Session 5 to Session 8 of *Professional Programming in Java* course should be covered in this session.	**Professional Programming in Java** Session 5, 6, 7, & 8
7	**OOPJVA – TL7**	All the topics as listed below from Session 9 and Session 10 of *Professional Programming in Java* book should be covered in this session. **Session 9 – JDBC API** ➢ Explain basics of JDBC ➢ Explain JDBC architecture ➢ Explain different types of processing models ➢ Explain JDBC Driver Types ➢ Understand the steps involved in JDBC application development ➢ Explain Database Meta Information ➢ Explain parameterized queries in JDBC API **Session 10 – Advanced JDBC Features**	**Professional Programming in Java** SG - Session 9 & 10 XP - Session 9 & 10 TG – Session 9 & 10

Session No.	Session Title	Session Details	Deliverables' Mapping
		➢ List and describe scrollable result sets ➢ List different types of ResultSet and row-positioning methods ➢ Explain stored procedures ➢ Explain how to call a stored procedure using JDBC API ➢ Describe the steps to update records ➢ Explain the steps of implementing transactions using JDBC ➢ List the enhancements of JDBC 4.0 API ➢ Explain RowSet and its type ➢ Describe JDBC 4.1 RowSetProvider and RowSetFactory Interfaces	
8	OOPJVA – TL8	All the topics as listed below from Session 11 and Session 12 of *Professional Programming in Java* book should be covered in this session. **Session 11 – Design Patterns** ➢ Describe polymorphism ➢ Describe the procedure to override methods of the Object ➢ class ➢ Explain design patterns ➢ Describe the Singleton, Data Access Object (DAO), and Factory ➢ and Observer design patterns ➢ Describe delegation ➢ Explain composition and aggregation **Session 12 – Internationalization and Localization** ➢ Describe internationalization	**Professional Programming in Java** SG - Session 11 & 12 XP - Session 11 & 12 TG – Session 11 & 12

Session No.	Session Title	Session Details	Deliverables' Mapping
		➢ Describe localization ➢ Describe the Unicode character encoding ➢ Explain the internationalization process ➢ Define the internationalization elements	
9	**OOPJVA – TL9**	The workshop lessons of Session 9 to Session 12 of *Professional Programming in Java* course should be covered in this session.	**Professional Programming in Java** Session 9, 10, 11, & 12
10	**OOPJVA – TL10**	All the topics as listed below from Session 13 of *Professional Programming in Java* book should be covered in this session. **Session 13 – Advanced Concurrency and Parallelism** ➢ Explain the enhancements of java.util.concurrency package ➢ Describe atomic operations with the new set of classes of the java.util.concurrent.atomic package ➢ Explain the StampedLock class to implement locks ➢ Explain the new features of ForkJoinPool ➢ Define parallel streams ➢ Describe parallel sorting of arrays ➢ Identify recursive actions of the fork/join framework	**Professional Programming in Java** SG - Session 13 XP - Session 13 TG – Session 13
11	**OOPJVA – TL11**	All the topics as listed below from Session 14 of *Professional Programming in Java* book should be covered in this session. **Session 14 – Java Class Design and Advanced Class Design** ➢ Explain Java access modifiers	**Professional Programming in Java** SG - Session 14 XP - Session 14 TG – Session 14

Session No.	Session Title	Session Details	Deliverables' Mapping
		➢ Explain advanced OOP concepts in Java ➢ Describe packages ➢ Define abstract class ➢ Explain the use of static and final keywords ➢ Identify different types of inner classes ➢ Explain advanced types	
12	OOPJVA – TL12	The workshop lessons of Session 13 and Session 14 of *Professional Programming in Java* course should be covered in this session.	**Professional Programming in Java** Session 13 & 14
13	OOPJVA – TL13 & TL14	All the topics as listed below from Session 15 and Session 16 of *Professional Programming in Java* book should be covered in this session. **Session 15 – Effective Programming with Lambda** ➢ Explain lambdas ➢ Identify the built-in functional interfaces ➢ Explain code refactoring for readability using lambdas ➢ Describe debugging of lambda **Session 16 – Java Data Structures** ➢ Explain the Enumeration interface ➢ Describe the BitSet class ➢ Describe the Stack classes ➢ Explain the Dictionary classes	**Professional Programming in Java** SG - Session 15 & 16 XP - Session 15 & 16 TG – Session 15 & 16
14	OOPJVA – TL15	The workshop lessons of Session 15 and Session 16 of *Professional Programming in Java* course should be covered in this session.	**Professional Programming in Java** Session 15 & 16

Session No.	Session Title	Session Details	Deliverables' Mapping
15	**OOPJVA – TL16 & TL17**	All the topics as listed below from Session 17 and Session 18 of *Professional Programming in Java* book should be covered in this session. **Session 17 – Java Logging API and ResourceBundle** ➢ Describe the Log4J architecture ➢ Identify Log4J configuration options ➢ Explain the file appender ➢ Explain the JDBC appender ➢ Identify the ResourceBundle class **Session 18 –Java Documentation and Networking** ➢ Explain the Javadoc tool ➢ Describe the key classes of the java.net package ➢ Explain socket programming ➢ Explain URL processing	**Professional Programming in Java** SG - Session 17 & 18 XP - Session 17 & 18 TG – Session 17 & 18
16	**OOPJVA – TL18**	The workshop lessons of Session 17 and Session 18 of *Professional Programming in Java* course should be covered in this session.	**Professional Programming in Java** Session 17 & 18

6. Library References

➢ **Java 8 Programmer II Study Guide: Exam 1Z0-809** by Esteban Herrera
➢ **Oracle Certified Professional Java SE 8 Programmer II STUDY GUIDE EXAM 1ZO-809** by Jeanne Boyarsky and Scott Selikoff
➢ **OCA / OCP Java SE 8 Programmer Certification Kit: Exam 1Z0−808 and Exam 1Z0−80921** by Jeanne Boyarsky and Scott Selikoff

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