Aptech

Unleash your potential

Module Presenter's Manual

for

Application Development Fundamentals-I

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:

- Develop classes and how declare classes
- Create a Java class
- Understand the benefits of using an IDE
- Declare and initialize variables
- List and understand the different data types
- Understand the major operators
- Understand the use of decision making and loop constructs
- Work with Arrays and String classes
- Understand the use of packages and access specifiers
- Use inheritance to declare and define a subclass for a superclass
- Understand nested class
- Describe error handling in a Java program

2. Information on Session Allocation

Module	Online Hours (No.of Hrs)
Application Development Fundamentals - I	**36**

Throughout this Presenter's Manual, the module **Application Development Fundamentals - I** will be referred to as **Java-I.**

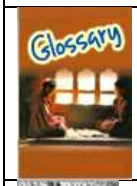
3. Module Deliverables available on OnlineVarsity

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 hrs**

➢ Week-Wise Schedule

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

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

5. Session Coverage

Session No.	Session Title	Session Details	Deliverables' Mapping
1	**JAVA-I – TL1**	All the topics as listed below from Session 1 and Session 2of *Fundamental Programming in Java* book should be covered in this session. **Session 1 – Introduction to Java** ➢ Explain the structured programming paradigm ➢ Explain the object-oriented programming paradigm ➢ Explain the features of Java as a OOP language ➢ Describe Java platform and its components ➢ List the different editions of Java ➢ Explain the evolution of Java Standard Edition (Java SE) ➢ Describe the steps for downloading and installing Java Development Kit (JDK) **Session 2 – Application Development in Java** ➢ Explain the structure of a Java class ➢ List and explain steps to write a Java program ➢ Identify the benefits of NetBeans IDE ➢ Describe the various elements of NetBeans IDE ➢ Explain the steps to develop, compile, and execute Java program using NetBeans IDE ➢ Explain the various components of JVM ➢ Describe comments in Java	**Fundamental Programming in Java** SG - Session 1 & 2 XP - Session 1 & 2 TG – Session 1 & 2

Session No.	Session Title	Session Details	Deliverables' Mapping
2	**JAVA-I – TL2**	All the topics as listed below from Session 3 and Session 4 of *Fundamental Programming in Java* book should be covered in this session. **Session 3 – Variables and Operators** ➢ Explain variables and their purpose ➢ State the syntax of variable declaration ➢ Explain the rules and conventions for naming variables ➢ Explain data types ➢ Describe primitive and reference data types ➢ Describe escape sequence ➢ Describe format specifiers ➢ Identify and explain different type of operators ➢ Explain the concept of casting ➢ Explain implicit and explicit conversion **Session 4 – Decision-Making Constructs** ➢ Identify the need for decision-making statements ➢ List the different types of decision-making statements ➢ Explain the if statement ➢ Explain the various forms of if statement ➢ Explain the switch-case statement ➢ Explain the use of strings and enumeration in the switch-case statement ➢ Compare the if-else and switch-case statement	**Fundamental Programming in Java** SG - Session 3 & 4 XP - Session 3 & 4 TG – Session 3 & 4

Session No.	Session Title	Session Details	Deliverables' Mapping
3	**JAVA-I – TL3**	The workshop lessons of Session 1 to Session 4 of *Fundamental Programming in Java* course should be covered in this session.	**Fundamental Programming in Java** Session 1, 2, 3, & 4
4	**JAVA-I – TL4**	All the topics as listed below from Session 5 and Session 6 of *Fundamental Programming in Java* book should be covered in this session. **Session 5 – Looping Constructs** ➢ List the different types of loops ➢ Explain the while statement and the associated rules ➢ Identify the purpose of the do-while statement ➢ State the need of for statement ➢ Describe nested loops ➢ Compare the different types of loops ➢ State the purpose of jump statements ➢ Describe break statement ➢ Describe continue statement **Session 6 – Classes and Objects** ➢ Explain creation of classes in Java ➢ Explain the instantiation of objects in Java ➢ Explain the purpose of instance variables and instance methods ➢ Explain constructors in Java ➢ Explain the memory management in Java ➢ Explain object initializers	**Fundamental Programming in Java** SG - Session 5 & 6 XP - Session 5 & 6 TG – Session 5 & 6
5	**JAVA-I – TL5**	All the topics as listed below from Session 7 and Session 8 of *Fundamental Programming in Java* book should be covered in this session. **Session 7 – Methods and Access Specifiers**	**Fundamental Programming in Java** SG – Session 7 & 8 XP - Session 7 & 8 TG – Session 7 & 8

Session No.	Session Title	Session Details	Deliverables' Mapping
		➢ Describe methods ➢ Explain the process of creation and invocation of methods ➢ Explain passing and returning values from methods ➢ Explain variable argument methods ➢ Describe the use of Javadoc to lookup methods ➢ Describe access specifiers and the types of access specifiers ➢ Explain the use of access specifiers with methods ➢ Explain the concept of method overloading ➢ Explain the use of this keyword **Session 8 – Arrays and Strings** ➢ Describe an array ➢ Explain declaration, initialization, and instantiation of a single-dimensional array ➢ Explain declaration, initialization, and instantiation of a multi-dimensional array ➢ Explain the use of loops to process an array ➢ Describe ArrayList and accessing values from an ArrayList ➢ Describe String and StringBuilder classes ➢ Explain command line arguments ➢ Describe Wrapper classes, autoboxing, and unboxing	
6	**JAVA-I – TL6**	The workshop lessons of Session 5 to Session 8 of *Fundamental Programming in Java* course should be covered in this session.	**Fundamental Programming in Java** Session 5, 6, 7, & 8

Session No.	Session Title	Session Details	Deliverables' Mapping
7	**JAVA-I – TL7**	All the topics as listed below from Session 9 and Session 10 of *Fundamental Programming in Java* book should be covered in this session. **Session 9 – Modifiers and Packages** ➢ Describe field and method modifiers ➢ Explain the different types of modifiers ➢ Explain the rules and best practices for using field modifiers ➢ Describe class variables ➢ Explain the creation of static variables and methods ➢ Describe package and its advantages ➢ Explain the creation of user-defined package ➢ Explain the creation of .jar files for deployment **Session 10 – Inheritance and Polymorphism** ➢ Describe inheritance ➢ Explain the types of inheritance ➢ Explain super class and subclass ➢ Explain the use of super keyword ➢ Explain method overriding ➢ Describe Polymorphism ➢ Differentiate type of reference and type of objects ➢ Explain static and dynamic binding ➢ Explain virtual method invocation ➢ Explain the use of abstract	**Fundamental Programming in Java** SG - Session 9 & 10 XP - Session 9 & 10 TG – Session 9 & 10

Session No.	Session Title	Session Details	Deliverables' Mapping
		keyword	
8 & 9	**JAVA-I – TL8 & TL9**	All the topics as listed below from Session 11 and Session 12 of *Fundamental Programming in Java* book should be covered in this session. **Session 11 – Interfaces and Nested Classes** ➢ Describe Interface ➢ Explain the purpose of interfaces ➢ Explain implementation of multiple interfaces ➢ Describe Abstraction ➢ Explain Nested class ➢ Explain Member class ➢ Explain Local class ➢ Explain Anonymous class ➢ Describe Static nested class **Session 12 – Exceptions** ➢ Describe exceptions ➢ Explain types of errors and exceptions ➢ Describe the Exception class ➢ Describe exception handling ➢ Explain try-catch block ➢ Explain finally block ➢ Explain execution flow of exceptions ➢ Explain guidelines to exception handling	**Fundamental Programming in Java** SG - Session 11 & 12 XP - Session 11 & 12 TG – Session 11 & 12
10	**JAVA-I – TL10**	The workshop lessons of Session 9 to Session 12 of *Fundamental Programming in Java* course should be covered in this session.	**Fundamental Programming in Java** Session 9, 10, 11, & 12

Session No.	Session Title	Session Details	Deliverables' Mapping
11	**JAVA-I – TL11**	All the topics as listed below from Session 13 of *Fundamental Programming in Java* book should be covered in this session. **Session 13 – New Date and Time API** ➢ Explain new classes of the Date and Time API in Java 8 ➢ Explain Enum and Clock types ➢ Describe the role of time-zones in Java 8 ➢ Explain support for backward compatibility in the new API	**Fundamental Programming in Java** SG - Session 13 XP - Session 13 TG – Session 13
12	**JAVA-I – TL12**	All the topics as listed below from Session 14 of *Fundamental Programming in Java* book should be covered in this session. **Session 14 – Annotations and Base64 Encoding** ➢ Explain declaring an annotation type in Java ➢ Describe predefined annotation types ➢ Explain Type annotations ➢ Explain Repeating annotations ➢ Describe Base64 encoding	**Fundamental Programming in Java** SG - Session 14 XP - Session 14 TG – Session 14
13	**JAVA-I – TL13**	The workshop lessons of Session 13 and Session 14 of *Fundamental Programming in Java* course should be covered in this session.	**Fundamental Programming in Java** Session 13 & 14
14 & 15	**JAVA-I – TL14 & TL15**	All the topics as listed below from Session 15 and Session 16 of *Fundamental Programming in Java* book should be covered in this session. **Session 15 – Functional Programming in Java** ➢ Explain lambda expressions	**Fundamental Programming in Java** SG - Session 15 & 16 XP - Session 15 & 16 TG – Session 15 & 16

Session No.	Session Title	Session Details	Deliverables' Mapping
		➢ Describe method references ➢ Explain functional interfaces ➢ Explain default methods **Session 16 – Stream API** ➢ Describe the Stream API ➢ Outline the differences between collections and streams ➢ Explain the classes and interfaces in Stream API ➢ Describe how to use functional interfaces with Stream API ➢ Describe the Optional class and Spliterator interface ➢ Explain stream operations ➢ Explain the limitations of Stream API	
16	**JAVA-I – TL16**	The workshop lessons of Session 15 and Session 16 of *Fundamental Programming in Java* course should be covered in this session.	**Fundamental Programming in Java** Session 15 & 16
17	**JAVA-I – TL17**	All the topics as listed below from Session 17 and Session 18 of *Fundamental Programming in Java* book should be covered in this session. **Session 17 – More on Functional Programming** ➢ Explain functional interfaces ➢ Describe immutability in Java ➢ Define and explain concurrency in Java ➢ Explain Recursion in Java **Session 18 – Additional Features of Java 8** ➢ Explain the Nashorn Engine ➢ Describe the jjs tool and its use	**Fundamental Programming in Java** SG - Session 17 & 18 XP - Session 17 & 18 TG – Session 17 & 18

Session No.	Session Title	Session Details	Deliverables' Mapping
		for scripting ➢ Explain the new mathematical functions in Java 8	
18	**JAVA-I – TL18**	The workshop lessons of Session 17 and Session 18 of *Fundamental Programming in Java* course should be covered in this session.	**Fundamental Programming in Java** Session 17 & 18

6. Library References

- **OCA Java SE 8 Programmer I Study Guide (Exam 1z0-808)** by Finegan, Edward G., Liguori, Robert
- **Java SE 8 for Programmers by Paul Deitel and Harvey Deitel**
- **Java 8 in Action** by Raoul-Gabriel Urma, Mario Fusco, and Alan Mycroft

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