# Module
# Presenter's Manual

## *for*

## Java Programming - I

**Effective from: April, 2024**
**Ver. 1.0**

# Amendment Record

| Version No. | Effective Date | Change | Replaced Pages |
|---|---|---|---|
| 1.0 | April 2024 | 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
➢ Declare and initialize variables
➢ Explore the different data types in Java
➢ Understand the major operators
➢ Understand the use of decision making and loop constructs
➢ Work with Arrays and String classes
➢ Learn 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
➢ Explain the new Date and Time API
➢ Explain the Functional Programming in Java
➢ Explain the new Features of Java
➢ Explain JDK 20 new Features and Functionalities

## 2. Information on Session Allocation

| Module | Online Hours |
|---|---|
| **Java Programming - I** | 36 |

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

## 3. Module Deliverables on OnlineVarsity

To aid the teaching process, following are the deliverables:

Resources available on Onlinevarsity:

| Feature - Description/Functionality |
|---|
| *Ebook*-Student reading material in the form of PDF. |
| *Download eBook -* Student has the option to download the subject related e-book and read offline. |
| *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. |

## 4. Week-wise Session Schedule

- **A session is of 2 hours duration.**

| 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**: Java Programming - 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 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br>**Session 1 – Introduction to Java**<br>➢ Explain structured programming paradigm<br>➢ Explain object-oriented programming paradigm<br>➢ Explain features of Java as a OOP language<br>➢ Describe Java platform and its components<br>➢ List different editions of Java<br>➢ Explain evolution of Java Standard Edition (Java SE)<br>➢ Describe steps for downloading and installing Java Development Kit (JDK) | **Java Programming - The Complete Guide for Beginners**<br><br>SG - Session 1<br>XP - Session 1<br>TG - Session 1 |
| 2 | JAVA - I-TL2 | All the topics as listed below from Session 2 and Session 3 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br>**Session 2 – Variables, Data Types, and Operators**<br>➢ Explain variables and their purpose<br>➢ Explain the syntax of variable declaration<br>➢ Explain the rules and conventions for naming variables<br>➢ Explain data types<br>➢ Explain primitive and reference data types<br>➢ Explain escape sequence<br>➢ Explain format specifiers<br>➢ Identify and explain different type of operators<br>➢ Explain the concept of casting<br>➢ Explain implicit and explicit conversion | **Java Programming - The Complete Guide for Beginners**<br><br>SG - Session 2 & 3<br>XP - Session 2 & 3<br>TG - Session 2 & 3 |

| Session No. | Session Title | Session Details | Deliverables' Mapping |
|---|---|---|---|
| | | <u>**Session 3 – Decision-Making Constructs and Loops**</u><br><br>➢ List different types of decision-making statements<br><br>➢ Explain the if statement and various forms of if statement<br><br>➢ Explain switch-case statement<br><br>➢ Compare the if-else and switch-case statement<br><br>➢ List different types of loops<br><br>➢ Explain the while statement and the associated rules<br><br>➢ Identify the purpose of the do-while statement<br><br>➢ Identify the necessity of the for statement<br><br>➢ Describe nested loops<br><br>➢ Compare different types of loops<br><br>➢ Illustrate the purpose of jump statements<br><br>➢ Describe break statement<br><br>➢ Describe continue statement | |
| 3 | JAVA - I-TL3 | The **Try It Yourself** questions of Session 1 to Session 3 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session. | <u>**Java Programming - The Complete Guide for Beginners**</u><br><br>Session 1-3 |
| 4 | JAVA - I-TL4 | All the topics as listed below from Session 4 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br><u>**Session 4 – Classes, Objects, and Methods**</u><br><br>➢ Explain process of creation of classes in Java<br><br>➢ Explain instantiation of objects in Java<br><br>➢ Explain purpose of instance variables and instance methods<br><br>➢ Describe constructors and methods<br><br>➢ Explain memory management in Java<br><br>➢ Explain object initializers<br><br>➢ Describe access specifiers and the types of access specifiers | <u>**Java Programming - The Complete Guide for Beginners**</u><br><br>SG - Session 4<br>XP - Session 4<br>TG - Session 4 |

| Session No. | Session Title | Session Details | Deliverables' Mapping |
|---|---|---|---|
| | | ➢ Explain concept of method overloading<br>➢ Elaborate the use of *this* keyword | |
| 5 | **JAVA - I-TL5** | All the topics as listed below from Session 5 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br>**Session 5 – Arrays and Strings**<br>➢ Describe an array<br>➢ Explain declaration, initialization, and instantiation of a single-dimensional array<br>➢ Explain declaration, initialization, and instantiation of a multi-dimensional array<br>➢ Explain the use of loops to process an array<br>➢ Describe ArrayList and accessing values from an ArrayList<br>➢ Describe String and StringBuilder classes<br>➢ Describe Wrapper classes, autoboxing, and unboxing | **Java Programming - The Complete Guide for Beginners**<br><br>SG - Session 5<br>XP - Session 5<br>TG - Session 5 |
| 6 | **JAVA - I-TL6** | The **Try It Yourself** questions of Session 4 and Session 5 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session. | **Java Programming - The Complete Guide for Beginners**<br><br>Session 4 & 5 |
| 7 | **JAVA - I-TL7** | All the topics as listed below from Session 6 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br>**Session 6 – Modifiers and Packages**<br>➢ Describe field and method modifiers<br>➢ Explain different types of modifiers<br>➢ Explain rules and best practices for using field modifiers<br>➢ Describe class variables<br>➢ Explain creation of static variables and methods | **Java Programming - The Complete Guide for Beginners**<br><br>SG - Session 6<br>XP - Session 6<br>TG - Session 6 |

| Session No. | Session Title | Session Details | Deliverables' Mapping |
|---|---|---|---|
| | | ➢ Describe package and its advantages<br>➢ Explain creation of user-defined package<br>➢ Explain creation of .jar files for deployment | |
| 8 | JAVA - I-TL8 | The **Try It Yourself** questions of Session 6 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session. | **Java Programming - The Complete Guide for Beginners**<br><br>Session 6 |
| 9 | JAVA - I-TL9 | All the topics as listed below from Session 7 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br>**Session 7 – Inheritance and Polymorphism**<br>➢ Describe inheritance<br>➢ Explain the types of inheritance<br>➢ Explain super class and subclass<br>➢ Explain the use of super keyword<br>➢ Explain method overriding<br>➢ Describe Polymorphism<br>➢ Distinguish type of reference and type of objects<br>➢ Explain static and dynamic binding<br>➢ Explain virtual method invocation<br>➢ Explain the use of abstract keyword | **Java Programming - The Complete Guide for Beginners**<br><br>SG - Session 7<br>XP - Session 7<br>TG - Session 7 |
| 10 | JAVA - I-TL10 | The **Try It Yourself** questions of Session 7 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session. | **Java Programming - The Complete Guide for Beginners**<br><br>Session 7 |
| 11 | JAVA - I-TL11 | All the topics as listed below from Session 8 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br>**Session 8 – Interfaces and Nested Classes**<br>➢ Describe interfaces<br>➢ Illustrate the purpose of interfaces<br>➢ Explain implementation of multiple interfaces<br>➢ Describe private methods in interfaces | **Java Programming - The Complete Guide for Beginners**<br><br>SG - Session 8<br>XP - Session 8<br>TG - Session 8 |

| Session No. | Session Title | Session Details | Deliverables' Mapping |
|---|---|---|---|
| | | ➢ Define Abstraction<br>➢ Explain Nested class<br>➢ Explain Member class<br>➢ Explain Local class<br>➢ Elaborate Anonymous class<br>➢ Outline static nested class | |
| 12 | JAVA - I-TL12 | The **Try It Yourself** questions of Session 8 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session. | **Java Programming - The Complete Guide for Beginners**<br><br>Session 8 |
| 13 | JAVA - I-TL13 | All the topics as listed below from Session 9 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br>**Session 9 – Exceptions**<br>➢ Describe exceptions<br>➢ Explain types of errors and exceptions<br>➢ Elaborate the Exception class<br>➢ Describe exception handling<br>➢ Explain try-catch block<br>➢ Explain finally block<br>➢ Explain execution flow of exceptions<br>➢ Summarize guidelines for exception handling | **Java Programming - The Complete Guide for Beginners**<br><br>SG - Session 9<br>XP - Session 9<br>TG - Session 9 |
| 14 | JAVA - I-TL14 | All the topics as listed below from Session 10 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br>**Session 10 – Date and Time API**<br>➢ Explain classes of the Date and Time API<br>➢ Explain Enum and Clock types<br>➢ Describe the role of time-zones<br>➢ Explain support for backward compatibility in the new API<br>➢ Explain about Stream of Dates | **Java Programming - The Complete Guide for Beginners**<br><br>SG - Session 10<br>XP - Session 10<br>TG - Session 10 |
| 15 | JAVA - I-TL15 | The **Try It Yourself** questions of Session 9 and Session 10 of *Java Programming - The* | **Java Programming - The Complete Guide for Beginners** |

| Session No. | Session Title | Session Details | Deliverables' Mapping |
|---|---|---|---|
| | | *Complete Guide for Beginners* book should be covered in this session. | Session 9 & 10 |
| 16 | **JAVA - I-TL16** | All the topics as listed below from Session 11 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br>**Session 11 – Additional Features of Java**<br><br>➢ Explain Lambda Expressions<br>➢ Explain the use of Generics<br>➢ Elaborate the use of annotations<br>➢ Describe streams<br>➢ Define modules<br>➢ Explain switch expressions<br>➢ Describe *text* blocks<br>➢ Outline the use of pattern matching for *instanceof* | **Java Programming - The Complete Guide for Beginners**<br><br>SG - Session 11<br>XP - Session 11<br>TG - Session 11 |
| 17 | **JAVA - I-TL17** | All the topics as listed below from Session 12 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session.<br><br>**Session 12 – JDK 20 New Features and Functionalities**<br>➢ Explain Virtual Threads<br>➢ Explain Vector API<br>➢ Describe Structured Concurrency<br>➢ Outline Scoped Values<br>➢ Describe Foreign Function and Memory API<br>➢ Summarize Features of Record Patterns<br>➢ Explain Pattern Matching for switch Statements and Expressions | **Java Programming - The Complete Guide for Beginners**<br><br>SG - Session 12<br>XP - Session 12<br>TG - Session 12 |
| 18 | **JAVA - I-TL18** | The **Try It Yourself** questions of Session 11 and Session 12 of *Java Programming - The Complete Guide for Beginners* book should be covered in this session. | **Java Programming - The Complete Guide for Beginners**<br><br>Session 11 & 12 |

## 6. Library References

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| ➢ **Head First Java** by Kathy Sierra & Bert Bates |
| ➢ **Java: A Beginner's Guide** by Herbert Schildt |
| ➢ **Java for Dummies** by Barry A. Burd |