



IBM

JAVA FUNDAMENTALS TRAINING MODULE

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The Java Fundamentals training module provides the participant to understand Object Oriented Programming concepts and work using Java concepts, datatypes, String class, wrapper class, collection API, exception and file handling in java. Also teaches about multithreading, Lambda expression, database connectivity using data access objects.

VERSION

JAVA 8

LEARNING OBJECTIVES

- Understanding Object-Oriented Programming Concepts.
- Introduction to Java platform.
- Explain variables, strings, operators and datatype.
- Usage of Java language fundamentals using classes and objects.
- Implementation of Object-Oriented Programming Concepts
- Advantage of using Java API classes
- Understand and implement Exceptions.
- Implement file handling.
- Understanding and implement multithreading.
- Usage of collection framework.
- Understand the need for Lambda expressions
- Implement Java database connectivity.

PREREQUISITES SKILLS

- Computer Science fundamentals
- Basic knowledge of any programming and object-oriented language, and math.

SKILL LEVEL

Basic – Intermediate

HARDWARE**REQUIREMENTS**

Processor	2 GHz or Higher
GB RAM	8 GB
GB Disk Free	80 GB
Network Requirements	Yes

SOFTWARE REQUIREMENTS

Operating System	Windows / Linux
Java	Java8 onwards
Database	MySQL or Oracle or DB2
IDE	Eclipse compatible for Java8

The following chapter and exercise durations are estimated and might not reflect every class experience. The estimates do not include the duration of additional exercises or sections. Students in this course to have setup the software requirement as stated. The course contains test your knowledge after each chapter.

COURSE AGENDA**Chapter 1. Object Oriented Concepts**

Overview	This chapter introduction to all the components of Object-Orient concepts.
Learning Objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Explain what the terms are used in OOP• Difference between Objects and Classes in OOP.• Difference between command line arguments.

Chapter 2. Overview of Java Platform

Overview	This chapter provides the history of the Java program.
Learning Objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Introduction to Java evolution.• How to develop Java programs.• Introduction to the Eclipse IDE.• Implement programs to experience hands on.

Chapter 3. Java Language Fundamentals

Overview	This chapter explains and implements datatypes, variables, operators, programming constructs and arrays.
Learning Objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Use datatypes, variables and operators. • Work with programming constructions. • Understand Single dimensional and multiple dimensional array. • Implement programs to experience hands on.

Chapter 4. Creating Classes and Objects

Overview	This chapter explains about Java classes, objects, overloading, static members and initialization blocks.
Learning Objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Understand and implement the Java objects. • Implement programs to experience hands on. • Implement programs on Arrays. • Implement programs on static members.

Chapter 5. Implementing OOP Concepts

Overview	This chapter describes about encapsulation, aggregation, inheritance, cosmic class, polymorphism, abstract classes and interfaces.
Learning Objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Understand and implement OOPs concepts in Java. • Implement programs on abstract classes. • Implement programs on Interface and its usage.

Chapter 6. Useful Java API Classes

Overview	This Chapter explains the usage of Java Application Programming Interfaces (API), wrapper class.
Learning Objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Understand the usage of String, String Builder and String Buffer classes. • Implement programs on String class and its functions. • Implement programs using data and time class. • Implement programs using wrapper class.

Chapter 7. Exceptions

Overview	This chapter discusses about the Java exception declaration and handling customer exceptions.
Learning Objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Understand the exception API. • Difference between Checked and Unchecked exceptions. • Implement programs using checked and unchecked exceptions. • Implement custom exceptions.

Chapter 8. File Handling

Overview	This chapter introduces about files, folder, Stream API and its implementation. Also discusses about serialization.
Learning Objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Understand Java Stream APIs. • Implement programs to stream classes to read data from file. • Implement programs using serialization and deserialization

Chapter 9. MultiThreading

Overview	This chapter introduces threading in java and advanced concepts of handling multi-threads in Java.
Learning Objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Understand Java threads and its lifecycle. • Implement multi-thread programs. • Apply synchronization and Implement multi-thread programs.

Chapter 10. Collection Framework

Overview	This chapter explains generic, collection framework and how to compare objects..
Learning Objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Understand the collection framework and its utility classes. • Implement programs using few collection framework classes. • Implement programs to compare objects.

Chapter 11. Lamdba Expressions

Overview	This chapter explains about lambda expressions, type inference and its functionality..
Learning Objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Apply Lambda expression. • Understand the functional inference in Java 8. • Implement programs using Lambda expression.

Chapter 12. JDBC

Overview	This chapter explains the database connectivity and Java database connectivity API to apply in the Java programs.
Learning Objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none"> • Understand the JDBC concepts. • Implement JDBC program. • Implement JDBC program using Data Access Object (DAO).