

# Core Java 8 and Development Tools

## Lesson 00: Java SE 8

IGATE is now a part of Capgemini

People matter, results count.



# Course Goals and Non Goals

## ➤ Course Goals

- Implementing OOPs features in Java
- Developing Java Desktop Applications
- Use of Core JDK 1.8 API including JDBC 4.0
- Testing using Junit 4
- Logging Application using Log4J
- Implementing Multithreading

## ➤ Course Non Goals

- Developing GUI applications



# Pre-requisites

- Basic Programming Concepts
- OOPs
- DBMS/SQL
- XML

# Intended Audience

- Developers new to Java technology



# Day Wise Schedule

- Day 1

- Lesson 1: Introduction to Java
- Lesson 2: Eclipse 4.4 (Luna) as an IDE
- Lesson 3: Language Fundamentals
- Lesson 4: Classes and Objects

- Day 2

- Lesson 5: Exploring Basic Java Class Libraries
- Lesson 6: Inheritance and Polymorphism

- Day 3

- Lesson 7: Abstract Classes and Interfaces

- Day 4

- Lesson 9 : Exception Handling
- Lesson 10: Array

- Day 5

- Lesson 11: Collection
- Lesson 12: Generics

# Day Wise Schedule

## ■ Day 6

- Lesson 13: File IO
- Lesson 14: Introduction to JUnit 4

## ■ Day 7

- Lesson 15: Property Files
- Lesson 16: Java Database Connectivity (JDBC 4.0)

## ■ Day 8

- Lesson 17: Introduction to Layered Architecture

## ■ Day 9

- Lesson 19: Logging with Log4J
- Lesson 20: Multithreading

## ■ Day 10

- Lesson 21: Lambda Expressions
- Lesson 22: Stream API

## ■ Day 11

- Lesson 23: Debugging Concepts

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- Lesson 1: Introduction to Java
  - 1.1: Introduction to Java
  - 1.2: Features of Java
  - 1.3: Simple Program in Java
  - 1.4: Developing software in Java
  
- Lesson 2: Eclipse 4.4 (Luna) as an IDE
  - 2.1: Installation and Setting up Eclipse
  - 2.2: Introduction to Eclipse IDE
  - 2.3: Creating and Managing Java Projects
  - 2.4: Miscellaneous Options

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## ■ Lesson 3: Language Fundamentals

- 3.1: Keywords
- 3.2: Primitive Data Types
- 3.3: Operators and Assignments
- 3.4: Variables and Literals
- 3.5: Flow Control: Java's Control Statements
- 3.6: Best Practices

## ■ Lesson 4: Classes and Objects

- 4.1: Classes and Objects
- 4.2: Packages
- 4.3: Access Specifiers
- 4.4: Constructors - Default and Parameterized
- 4.5: this reference
- 4.6: Memory management in java
- 4.7: using static keyword
- 4.8: Enum
- 4.9: Best Practices



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## ■ Lesson 5: Exploring Basic Java Class Libraries

- 5.1: The Object Class
- 5.2: Wrapper Classes
- 5.3: Type casting
- 5.4: Using Scanner Class
- 5.5: System Class
- 5.6: String Handling
- 5.7: Date and Time API
- 5.8: Best Practices

## ■ Lesson 6: Inheritance and Polymorphism

- 6.1: Inheritance
- 6.2: Using super keyword
- 6.3: InstanceOf Operator
- 6.4: Method & Constructor overloading
- 6.5: Method overriding
- 6.6: @override annotation
- 6.7: Using final keyword

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- Lesson 7: Abstract Classes and Interfaces
  - 7.1: Abstract class
  - 7.2: Interfaces
  - 7.3: default methods
  - 7.4: static methods on Interface
  - 7.5 : Interface rules
  - 7.6: Abstract class Vs Interface
  - 7.7: Runtime Polymorphism

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- Lesson 9: Exception Handling
  - 9.1: Introduction
  - 9.2: Exception Types and Exception Hierarchy
  - 9.3: Try-catch-finally
  - 9.4: Try-with-resources
  - 9.5: Multi catch blocks
  - 9.6: Throwing exceptions using throw
  - 9.7: Declaring exceptions using throws
  - 9.8: User defined Exceptions
  - 9.9: Best Practices

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- Lesson 10: Array
  - 10.1: One dimensional array
  - 10.2: Multidimensional array
  - 10.3: Using varargs
  - 10.4: Using Arrays class
  - 10.5: Best Practices
- Lesson 11: Collection
  - 11.1: Collections Framework
  - 11.2: Collection Interfaces
  - 11.3: Iterating Collections
  - 11.4: Implementing Classes
  - 11.5: Comparable and Comparator
  - 11.6: Map implementation
  - 11.7: Legacy classes
  - 11.8: Best Practices
- Lesson 12: Generics
  - 12.1: Generics
  - 12.2: Writing Generic Classes
  - 12.3: Using Generics with Collections
  - 12.4: Best Practices

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- Lesson 13: File IO
  - 13.1: Overview of I/O Streams
  - 13.2: Types of Streams
  - 13.3: The Byte-stream I/O hierarchy
  - 13.4: Character Stream Hierarchy
  - 13.5: Buffered Stream
  - 13.6: The File class
  - 13.7: The Path class
  - 13.8: Object Stream
  - 13.9: Best Practices
- Lesson 14 : Introduction to JUnit 4
  - 14.1: Introduction
  - 14.2: JUnit
  - 14.3: Installing and Running JUnit
  - 14.4: Testing with JUnit
  - 14.5: Testing Exceptions
  - 14.6: Test Fixtures
  - 14.7: Best Practices

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- Lesson 15: Property Files
  - 15.1: What are Property Files?
  - 15.2: Types of Property files
  - 15.3: User defined Properties
- Lesson 16: Java Database Connectivity (JDBC 4.0)
  - 16.1: Java Database Connectivity - Introduction
  - 16.2: Database Connectivity Architecture
  - 16.3: JDBC APIs
  - 16.4: Database Access Steps
  - 16.5: Calling database procedures
  - 16.6: Using Transaction
  - 16.7: Connection Pooling
  - 16.8: DAO Design Pattern
  - 16.9: Best Practices

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- Lesson 17: Introduction to Layered Architecture
  - 17.1: Introduction
  - 17.2: Testing DAO Classes
  - 17.3: Testing Exceptions

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- Lesson 19: Logging with Log4J
  - 19.1 Log4J Introduction
  - 19.2 Log4J Concepts
  - 19.3 Installation of Log4J
  - 19.4 Configuring Log4J
  - 19.5: Log4J Pros and Cons
- Lesson 20: Multithreading
  - 20.1 Understanding Threads
  - 20.2 Thread life cycle
  - 20.3 Scheduling threads- Priorities
  - 20.4 Controlling threads using sleep(),join()



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- Lesson 21: Lambda Expressions
  - 21.1: Introduction to Functional Interface
  - 21.2: Writing Lambda Expressions
  - 21.3: Built in Functional Interfaces
  - 21.4: Built in Functional Interfaces and Lambda Expressions
  - 21.5: Method reference
- Lesson 22: Stream API
  - 22.1: Introduction to Stream API
  - 22.2: Working with Stream API
  - 22.3: Stream Operations

# References

## ■ Books:

- Java, The Complete Reference; by Herbert Schildt
- Thinking in Java; by Bruce Eckel
- Beginning Java 8 Fundamentals by Kishori Sharan

## ■ Websites:

- Java home page: <http://java.sun.com/>
- JDK 1.8 documentation: <http://docs.oracle.com/javase/8/docs/>
- Multithreading :  
<https://docs.oracle.com/javase/tutorial/essential/concurrency/index.html>



# Next Step Courses

- Servlets
- JSP



# Other Parallel Technology Areas

- C ++
- C#.Net
- Visual Basic.Net