



DTI-PSD-106

# Programming with Java

# Program Information



**Nature of the Course**  
Theory + Practical



**Total Hours per Day**  
2 hours



**Course Duration**  
4 Weeks

## Course Summary

This course is targeted for beginners who want to:

- Learn how to think and write meaningful pieces of code in java.
- Learn how to read JAVA code that has been written by somebody else.
- Learn how to map literacy description of a problem (requirement) to an application/library coded in java.

In summary, this course teaches how to program using the Java programming language. This is a basic level course that is essential for anyone who has no prior programming experience but wishes to be a professional Java engineer in future.

## Completion Criteria

- After fulfilling all of the following criteria, the student will be deemed to have finished the Module:
- Has attended 90% of all classes held
- Has received an average grade of 80% on all assignments
- Has received an average of 60% in assessments
- The tutor believes the student has grasped all of the concepts and is ready to go on to the second module.

## Required Textbooks

- David J. Eck, "Introduction to Programming using Java", Hobart and William Smith Colleges.
- Patrick Naughton & Herbert Schildt, "Java 2: The Complete Reference", Osborne Publishing.

# Prerequisites

- Fundamental understanding of programming, bits/bytes, procedures, classes, and computer architecture. It's absolutely acceptable if you only have a theoretical understanding of programming, but you should be certain about what programming is and what you intend to gain for this session.
- If you are only interested in theory and have no interest/patience in spending at least 10hr every week throughout the duration of the course, then this course might not be for you.
- If you have absolutely no idea about programming or do not see yourself doing programming in the next six months, then this class may not be for you.

# Course Details

## Basic Java Introduction and Concepts



### Week 1

#### Lesson 1

### Overview Of Java Language

- Introduction
  - Hardware and Software Requirements
  - Installation of JDK
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#### Lesson 2

### Programming with Java

- Class Declaration
  - Members of Classes
  - Structure of Java Classes
  - Main Method
  - Command Line Arguments
  - Source Code Compilation
  - Coding Convention
- 

#### Lesson 3

### Constant, Variables And Data Types

- Primitive and Non-Primitive Variables
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## Week 2

### Lesson 1

## Decision and Branching

- If, Else, Switch, Break, Continue
  - LOOPING
  - For, While, Do-While
- 

### Lesson 2

## Fundamentals Of Loops

- Initializing Objects
  - Static Members
  - Inheritance
  - Polymorphism
  - Encapsulation
- 



## Week 3

### Lesson 1

## Abstract Class And Interfaces

- Defining Interfaces
  - Separating Interface and Implementation
  - Implementing and Extending Interfaces
  - Abstract Classes
-

## Lesson 2

# Exception Handling

- Exceptions and the Exception Hierarchy
  - Throwing Exceptions
  - Catching Exceptions
  - Chaining Exceptions
  - The Finally Block
- 

## Lesson 3

# Advance Data Structures (Java Data Classes) Arrays

- List  $\langle e \rangle$  Interface and its Implementation
  - Map  $\langle k, v \rangle$  Interface and Implementation
  - Set  $\langle e \rangle$  Interface and Implementation
- 



## Week 4

## Lesson 1

# JDBC Connection

- JDBC Overview
  - Using Driver Manager, Connection, Statement, Prepared Statement and Result Set
  - Create, Delete, Insert, Update Statements
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# Program Information

## Intermediate Java: Level 2



**Nature of the Course**  
Theory + Practical



**Total Hours per Day**  
2 hours



**Course Duration**  
4 Weeks

## Course Summary

The Java course for beginners is designed for people who wish to learn how to produce meaningful Java code, how to interpret JAVA code written by others, and how to convert a literary description of a problem (requirement) to an application / library in Java. This is a fundamental level course is also suitable for people with no prior programming experience who intend to work as a professional Java engineer in the future.

## Completion Criteria

- After fulfilling all of the following criteria, the student will be deemed to have finished the Module:
- Has attended 90% of all classes held
- Has received an average grade of 80% on all assignments
- Has received an average of 60% in assessments
- The tutor believes the student has grasped all of the concepts and is ready to go on to the second module.

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# Prerequisites

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# Course Details



## Week 1

### Lesson 1

## Web Application Basics

- How the Web Works
  - HTTP Overview, HTML Review
  - Overview of Java EE, Servlets & Web Applications
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### Lesson 2

## Servlet Api

- HTML Forms
  - HTTP: Request-Response, Headers, GET, POST
  - Overview: How Servlets Work
  - Servlet Lifecycle: `init()`, `service()`, `destroy()`
  - Requests and Responses
  - HTTP Servlets:
    - `HttpServletRequest`
    - `HttpServletResponse`
    - `HttpServlet`
  - Deployment Descriptor
  - Accessing Parameters
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## Week 2 :

### Lesson 1

## Additional Servlet Capabilities

- Request dispatcher: Including and Forwarding
  - Sharing Data with Request Object Attributes
  - Sharing Data with Servlet Context and Application Context
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### Lesson 2

## Java Server Pages

- Basics and Overview
  - Lifecycle of a JSP
  - Scriptlet, Page Directive
  - Model View Controller (MVC)
  - Data Sharing among Servlets and JSP
  - Request, Application, Session and Page Scope
  - Predefined JSP Implicit Objects (Request, Session, Application, Page)
- 



## Week 3 :

### Lesson 1

## Using Custom Tags

- Custom Tags to Reduce JSP Complexity
  - The JSTL
  - JSP Expression Language (EL)
  - Using Custom Tags
  - The C:URL, C:Param, C:Foreach, C:Out Tags
-

## Lesson 2

# More Jsp Capabilities And Session Management

- HTTP as a Stateless Protocol
  - Hidden Form Fields
  - Cookies Overview: API, Using Cookies
  - Session Overview: Cookies and Session Tracking
  - HTTP Session
  - Putting Data into a Session Object
  - Retrieving Data from a Session Object
- 



## Week 4 :

## Lesson 1

# Additional Topics

- Servlet Filter Overview
  - Filtering Examples, Lifecycle & Filter Chains
  - Filter API, modifying a Request, Modifying a Response
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## Labs

Lab assignments will focus on the practice and mastery of contents covered in the lectures, and introduce critical and fundamental problem solving techniques to the students.

# Program Information

## Advanced Java: Level 3



**Nature of the Course**  
Theory + Practical



**Total Hours per Day**  
2 hours



**Course Duration**  
4 Weeks

## Course Summary

This level of the course builds on the foundation required to prepare trainees for a career as a Java Software Engineer.

## Completion Criteria

- After fulfilling all of the following criteria, the student will be deemed to have finished the Module:
- Has attended 90% of all classes held
- Has received an average grade of 80% on all assignments
- Has received an average of 60% in assessments
- The tutor believes the student has grasped all of the concepts and is ready to go on to the second module.

## Required Textbooks

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## Prerequisites

- Fundamental understanding of programming, bits/bytes, procedures, classes, and computer architecture. It's absolutely acceptable if you only have a theoretical understanding of programming, but you should be certain about what programming is and what you intend to gain from this session.
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# Course Details



## Week 1

### Lesson 1

## Groovy Fundamentals

- Differences between Groovy and Java
  - Closures
  - Lists and Maps
  - Ranges
  - Lists, Maps and Set
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### Lesson 2

## Servlet Api

- HTML Forms
  - HTTP: Request-Response, Headers, GET, POST
  - Overview: How Servlets Work
  - Servlet Lifecycle: `init()`, `service()`, `destroy()`
  - Requests and Responses
  - HTTP Servlets:
    - `HttpServletRequest`
    - `HttpServletResponse`
    - `HttpServlet`
  - Deployment Descriptor
  - Accessing Parameters
-



## Week 2 :

### Lesson 1

## Domain Classes

- Object-Relational Mapping with GORM
  - Constraints and Validation
  - Modeling Relationships
  - Performing CRUD Operations
  - Dynamic Queries
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### Lesson 2

## Scaffolding

- Generating Controllers
  - Generating Views
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## Week 3 :

### Lesson 1

## Controllers

- Setting the Default Action
  - Accessing Request Attributes
  - Flash Scope
  - Rendering a Response
  - Redirects and Returns
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## Lesson 2

# Groovy Server Pages

- Built-In Grails Tags
  - Layouts and Templates
  - Creating Custom Tags
- 



## Week 4 :

## Lesson 1

# Adding Ajax Support

- Basics of AJAX
  - AJAX-Supporting Tags
  - Rendering JSON and XML Responses
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## Lesson 2

# Services

- Transactions
  - Services and Dependency Injection
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# Labs

Lab assignments will focus on the practice and mastery of contents covered in the lectures, and introduce critical and fundamental problem solving techniques to the students.

## Learning Outcomes

- How to use Java to develop object-oriented designs.
- How to recognize Java language components and how they interact in applications.
- How to create stand-alone Java programs and program them.
- How to learn how to use Java Swing to create a graphical user interface (GUI) and APIs in the construction of programs.
- Will have a better understanding of how to employ exception handling in Java applications.
- Will become familiar with Java generics and the Java Collections API.
- How to create Java apps using threads and how to read and write files in Java.



