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# Introduction to Java with Eclipse

## *Summary*

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This course will introduce the student to the Java programming language, and will include a solid introduction to object-oriented programming techniques. Students will learn how to build, compile and test Java applications using the Eclipse IDE. This course reinforces the concepts taught with numerous daily labs that demonstrate real world solutions to real world problems. Students will leave this course with a solid understanding of Java syntax, object-oriented programming concepts and a working knowledge of the Eclipse IDE.

## *Duration*

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40 Hours of Lecture and Lab

## *Prerequisites*

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The student should have experience with at least one high level programming language. (C,C++,Cobol,Pascal,Visual Basic,etc.)

## *Topics*

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### **Java Overview**

- What is Java?
- Java vs. JavaScript
- Java vs. C++
- Platform Independence
- History of Java

### **Java Variables**

- Variable Declarations
- Primitive DataTypes vs Object Types
- Reserved Words
- Casting
- Naming Conventions

## **Operators**

- Mathematical Operators
- Operator Shortcuts
- Comparison Operators
- Boolean Operators
- Order of Operations

## **Flow of Control**

- Blocks
- If, Else If, Else
- Looping
- Switch Statement

## **Methods**

- Parameters and Arguments
- Return Types
- Method Overloading
- Varargs

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## Object-Oriented Programming

- What is Object-Oriented Programming?
- The Problems Solved by OOP
- What is an Object?
- Objects vs. Classes
- Abstraction
- Encapsulation
- Inheritance
- Polymorphism
- Constructors
- Creating an equals() Method
- Reference vs. Value
- Abstract Classes
- Interfaces

## JavaDoc

- Using the Java API Documentation
- Creating Custom JavaDocs
- JavaDoc Comments

## Wrapper Classes

- What are Wrapper Classes?
- Boxing
- Unboxing
- Autoboxing and Autounboxing
- Wrapper Class Utility Methods

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## Arrays, Collections and Generics

- Java Arrays
- For Each Loop and Arrays
- The Java Collections API
- List, Set, Map and Queue
- Vector, ArrayList, Stack and LinkedList
- Generics and Type Safety

## Exception Handling

- Exceptions vs. Errors
- Java Exception Terminology
- Try, Catch and Finally
- Checked Exceptions vs. Runtime Exceptions
- Understanding the Stack Trace
- Creating Custom Exceptions
- Using the Finally Block

## JDBC

- What is JDBC?
- JDBC Drivers
- Statements
- PreparedStatement
- CallableStatements
- Working with ResultSets
- JDBC Best Practices