# Techno India NJR Institute of Technology

## JAVA Technology

### Training Module

**Total Time: 2 Month**

**1. Getting Started**

- Examine Java technology
- Analyze a simple Java technology application
- Execute a Java technology application

**2. Object-Oriented Programming**

- Define modeling concepts: abstraction, encapsulation, and packages
- Discuss Java technology application code reuse
- Define class, member, attribute, method, constructor, and package
- Use the access modifiers private and public as appropriate for the guidelines of encapsulation
- Invoke a method on a particular object
- Use the Java technology API online documentation

**3. Identifiers, Keywords, and Types**

- Use comments in a source program
- Distinguish between valid and invalid identifiers
- Use the eight primitive types
- Define literal values for numeric and textual types
- Define the terms primitive variable and reference variable
- Declare variables of class type
- Construct an object using new and describe default initialization
- Describe the significance of a reference variable

**4. Expressions and Flow Control**

- Distinguish between instance and local variables
- Describe how to initialize instance variables
- Recognize, describe, and use Java software operators
- Distinguish between legal and illegal assignments of primitive types
- Identify boolean expressions and their requirements in control constructs
- Recognize assignment compatibility and required casts in fundamental types
- Use if, switch, for, while, and do constructions and the labeled forms of break and continue as flow control structures in a program continue as flow control structures in a program.

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## 5. Arrays

- Declare and create arrays of primitive, class, or array types
- Explain why elements of an array are initialized
- Explain how to initialize the elements of an array
- Determine the number of elements in an array
- Create a multidimensional array
- Write code to copy array values from one array to another

## 6. Class Design

- Define inheritance, polymorphism, overloading, overriding, and virtual method invocation
- Use the access modifiers protected and the default (package-friendly)
- Describe the concepts of constructor and method overloading
- Describe the complete object construction and initialization operation

## 7. Advanced Class Features

- Create static variables, methods, and initializes
- Create final classes, methods, and variables
- Create and use enumerated types
- Use the static import statement
- Create abstract classes and methods
- Create and use an interface

## 8. Exceptions and Assertions

- Define exceptions
- Use try, catch, and finally statements
- Describe exception categories
- Identify common exceptions
- Develop programs to handle your own exceptions
- Use assertions
- Distinguish appropriate and inappropriate uses of assertions
- Enable assertions at runtime

## 9. Collections and Generics Framework

- Describe the general purpose implementations of the core interfaces in the Collections framework
- Examine the Map interface

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- Examine the legacy collection classes
- Create natural and custom ordering by implementing the Comparable and Comparator
- Use generic collections and type parameters in generic classes
- Refactor existing non-generic code
- Write a program to iterate over a collection
- Examine the enhanced for loop

## 10. I/O Fundamentals

- Write a program that uses command-line arguments and system properties
- Examine the Properties class
- Construct node and processing streams, and use them appropriately
- Serialize and deserialize objects
- Distinguish readers and writers from streams, and select appropriately between them

## 11. Console I/ O and File I/O

- Read data from the console
- Write data to the console
- Describe files and file I/O

## 12. Building Java GUIs Using the Swing API

- Describe the JFC Swing technology
- Identify the Swing packages
- Describe the GUI building blocks: containers, components, and layout managers
- Examine top-level, general-purpose, and special-purpose properties of container
- Examine components
- Examine layout managers
- Describe the Swing single-threaded model
- Build a GUI using Swing components

## 13. Handling GUI-Generated Events

- Define events and event handling
- Examine the Java SE event model
- Describe GUI behavior
- Determine the user action that originated an event
- Develop event listeners
- Describe concurrency in Swing-based GUIs and describe the features of the SwingWorker class

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## 14. Threads

- Define a thread
- Create separate threads in a Java technology program, controlling the code and data that are used by that thread
- Control the execution of a thread and write platform-independent code with threads
- Describe the difficulties that might arise when multiple threads share data
- Use wait and notify to communicate between threads
- Use synchronized to protect data from corruption

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