COURSE OUTLINE

Tech Bairn

Let's accelerate the future

A real time java syllabus for academic and industrial purpose.

✓ Learn in a friendly and competitive environment.

✓ Our training segments are completely designed according to current IT industry.

✓ We religiously follow the **OCJP (Oracle certified Java Professional)** standard syllabus during our training session.

✓ Every java program execution will be explained clearly with a live demonstration with **java Compiler** and **JVM Architectures**

✓ **1000+** possible **industry** and **semester** oriented Programs will be discussed in training as well as in practice material.

✓ This training will be followed by a weekly test for technical skill development.

✓ Provides **1000+ FAQ's** chapter wise and its answers as well as **OCJP Exam** Oriented Questions.

✓ We get u practice last **7 years interview questions** arose by Technical Hrs. in the different Engineering colleges all over India.

✓ Every session follows by an interaction vice versa to keep students updated how to **develop projects** by using java technology.

✓ Multi-Platform Demonstration (difference between **Windows and Linux**)

✓ Use of Latest Tools & Technology along with a complete understanding.

✓ LCD equipped class room

✓ Unlimited Lab facility

✓ Real-Time Case Studies

Module 1- Introduction

- Types of Programming language and Paradigms.
- Java – what, where and why?
- Platform independency
- Comparison in Java with C and C++
- Role of Java Programmer in Industry.
- Java Evolution and History
- Features of Java Language.
- The Java Virtual Machine (JVM) – The heart of Java.
- Java's Magic Byte code
- JDK , JRE and JIT

Module 2– Language Fundamentals or Grammar of Java

- The Java Environment:
- Installing Java in WINDOWS and LINUX.
- Java Program Development in different environment.
- Java Source File Structure
- Introduction to VI, notepad, edit plus editor and Net beans, Eclipse IDE.
- Compilation and Executions procedure using different editor and IDE.
- Reference parameters, Output parameters.
- Access specifiers and its requirement in java.
- Naming conventions

Module 3- Reserve / Keywords present in Java

- Lexical Tokens, Identifiers

Abstract	Const	For	Implements	switch
Assert	Default	Go to	Package	super
Boolean	Do	If	Private	this
Break	Double	new	protected	throw
Byte	Else	Import	Instanceof	throws
Case	Enum	public	Return	static
Catch	Extends	Int	Interface	try
Char	Final	short	transient	void
volatile	Finally	Long	Strictfp	Class
Continue	Float	Native	synchronized	while

Module 4- Primitive Data types and Block in java

- Data types
- int , char , float , double , Boolean , short , long , byte
- UNICODE system
- Value type, Reference type.
- Types and Scope of variables
- Static variables, Instance variable, Local variables, final variable, transient variable, volatile variable.
- Static block and Non-static block.
- Static,non-static,final,abstract, native and synchronized
- Communicate java application with other language using java native interface.

Module 5- Java Operators

- Arithmetic operators,
- Relational operators,
- Logical operators,
- Shift operators
- Assignment Operators,
- Unary operator
- Bitwise operators,
- Special operators.
- Ternary operator

- Instanceof operator and typecasting.

Module 6- Wrapper Class

- Integer
- Character
- Float
- Double
- Boolean
- Short
- Long
- Type conversions
- Implicit conversion, Explicit conversion

Module 7- Decision making and branching PROGRAMMING WITH JAVA

- If statement
- If….Else statement and if….else ladder.
- Nested if
- Multiple if
- Switch... case statement
- Conditional operator vs. if statement
- Break and continue in java

Module 8- Decision making and looping

- While
- Do
- For
- For each

Module 9- Object Oriented Programming

- Class Fundamentals.
- Object & Object reference.
- Life time of object & Garbage Collection.
- Creating with Operating reference and Objects.
- Constructor & initialization code block.
- Access Control, Modifiers, methods
- Nested, Inner Class & Anonymous Classes
- Abstract Class & Interfaces
- Defining Methods, Argument Passing Mechanism
- Method Overloading, Recursion.

- Dealing with Static Members. Finalize () Method.
- Native Method.
- Use of "this" reference.
- Use of Modifiers with Classes & Methods.
- Design of Accessors and Mutator Methods
- Cloning Objects, shallow and deep cloning
- Generic Class Types

Module 10- Extending Classes and Inheritance

- Aggregation (HAS-A) and its uses.
- Use and Benefits of Inheritance (IS-A) over aggregation in OOP.
- Types of Inheritance in Java
- Role of Constructors in inheritance
- Polymorphism in OOP.
- Overriding Super Class Methods.
- Use of "super" keyword.
- Restriction in case of method overriding.
- Type Compatibility and Conversion
- Implementing interfaces.
- Dynamic method dispatching by down-casting and up-casting.

Module 11- Package

- Organizing Classes and Interfaces in Packages.
- Package as Access Protection
- Defining Package.
- Advantage of package
- Sub-Package
- CLASSPATH Setting for Packages.
- Making JAR Files for Library Packages
- Import and Static Import
- Creating .EXE and jar executable file.

Module 12- Exception Handling

- The Idea behind Exception
- Exceptions & Errors
- Types of Exception
- Checked and Un-Checked Exceptions
- Control Flow in Exceptions
- Use of try and catch block

- Multiple catch block
- Nested try
- finally block
- throw keyword
- Exception Propagation
- throws keyword
- Exception Handling with Method Overriding
- In-built and User Defined Exceptions
- Exception handling rule in case of method overriding.
- How to handle unreachable statements using finally.

Module 13- Array & String

- Defining an Array Single–
- Dimensional Array Initializing
- & Accessing Array Multi –
- Dimensional Array Jagged
- Array
- Arrays class
- Methods in Arrays class
- Sorting the elements of Array
- Searching, insert, delete dynamically.
- Matrix multiplication, addition, transpose, upper triangular, lower triangular, sparse matrix.
- String – what and why
- Operation on String
- Immutable String
- String comparison and concatenation
- Method of String class
- StringBuffer class and its methods.
- StringBuilder class in java.
- Creating Immutable class like String.
- Using Collection Bases Loop for String
- Tokenizing a String
- Object comparisons using Comparator and comparable interface.

Module 14- Dancing and Singing together "Multithreading "In Java

- Understanding Threads and process.
- Multithreading – what and why
- Creating Thread
- Thread Life-Cycle

- Thread Priorities
- Daemon thread
- Performing multiple job by multiple Thread.
- Runnable class.
- Synchronizing Threads – what and why
- Synchronized method
- Synchronized block
- Inter Communication of Threads
- Producer & Consumer problem without balancing
- Producer & Consumer problem with balancing using wait() & notify().

Module 15 - Transformation from CUI to GUI "Applet"

- Applet and its use
- Design Patterns using Applet and JApplet.
- Run Applet application by browser and applet tool.
- Applet Architecture.
- Parameters to Applet
- Life Cycle of Applet
- Embedding Applets in Web page.
- Graphics in Applet
- Displaying image in Applet
- Animation in Applet
- Painting in Applet
- Applet Communication
- Digital Clock in Applet
- Analog Clock in Applet

Module 16- Input/output Operation in Java (java.io Package)

- Streams and the new I/O Capabilities
- Understanding Streams
- File class and its methods.
- Creating file and folder using java code.
- The Classes for Input and Output
- FileOutputStream & FileInputStream
- FileWriter & FileReader
- Input from keyboard by InputStreamReader
- Input from keyboard by Console
- Input from keyboard by Scanner
- PrintStream class
- PrintWriter class

- BufferedReader and BufferedWriter class.
- Compressing and Uncompressing File.
- Reading and Writing data simultaneously
- DataInputStream and DataOutputStream
- The Standard Streams
- Working with File Object
- Java & XML Data Binding

  - o Marshalling
  - o Unmarshalling

Module 17- GUI Programming and Designing Graphical User Interfaces in Java
- Components and Containers
- Basics of Components
- Using Containers
- Layout Managers and user-defined layout.
- BorderLayout , FlowLayout , GridLayout , GridbagLayout, BoxLayout.
- AWT Components
- Adding a Menu to Window
- Extending GUI Features Using SWING Components
- Designing GUI using Netbeans.
- Advanced swing components like JProgressbar , JSlider, JRadioButton , JTree, JTable, JToggleButton, etc.

Module 18- Java Data Structure by the help of java.util Package.
- Collections of Objects
- Stack
- Queue & Deque
- Use of HashSet & TreeSet
- Sets
- Map
- Understanding Hashing
- Use of ArrayList & Vector
- Use of LinkedList.
- Use of HashMap & TreeMap
- LinkedHashMap class
- Hashtable class
- Generics

Module 19 - Event Handling
- Event-Driven Programming in Java

- Event- Handling Process with AWT.
- Working with Listeners
- Event-Handling Mechanism with SWING.
- Event Classes and its methods.
- Adapter Classes as Helper Classes in Event Handling
- Applet with Event-Handling.

Module 20 - Networking Programming
- Process and Networking Basics
- Client-Server Architecture.
- InetAddress class
- Communicate between two processes in single or different system.
- Two way communication
- Socket Overview
- Networking Classes and Interfaces
- Network Protocols
- Read and write operation between client and server.
- PrintWriter and BufferedReader class for read and write operation.
- Developing Networking Applications in Java
- Developing a chatting application.

Module 21- Database Programming using JDBC
- Introduction to JDBC
- Steps to connect to the database
- JDBC Drivers & Architecture
- Types of JDBC Drivers.
- Connectivity with Oracle
- Connectivity with MySQL

Module 22- Projects on J2SE
- A application just like Notepad
- A application like a Calculator
- A application like Address book
- Puzzle game
- Snake game
- A chatting Application.
- Paint Application
- Develop any editor.
- Library information System

<u>About Us</u>

We are on a mission to build a better future both for the students and their beloved country.

Our Story

"Techie Bairns" was born out of the desire to reach out to students who couldn't decide what to do next as a fresher. We have been endorsing in technologies in Bhubaneshwar since   Our understanding with the students and nurturing their talent,backed with expertise is what makes us a vibrant team.

What's with the name "Techie Bairns"

The word "Techie" is quite popular among everyone in and around us. "Bairn" whose colloquial translation is "kid". We wanted it something to be a one which is catchy and hence here it is "TECHIE BAIRNS".

Services offered by Techie Bairns

Techie bairns provide a number of programs for the students which helps them in enhancing their technical skills.

- **Training :** We provide training for the students on various courses,which are need of the hour.During this training the students will be able to learn and interact with our expert instructor,who will be there to explain topics in a great detail and at the same time help with your problems and at the same time provide personalized study as you progress through the course.
- **Workshop :** Techie Bairns organises certain workshops for the students in order for them to increase their understanding level. Theoretical knowledge is not always enough so it would be better if the students get hands on experience with the course they are pursuing.
- **Project help :** Apart from all these we also provide help in creating projects for the students.
- Research and Development