

| <b>Core + Advanced Java Syllabus</b>  |  |
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| <b>Session 1: Introduction to Java</b>  |  |
| ➤ Why Java and its Paradigms  | ➤ Java Programming Format  |
| ➤ Difference between JAVA & C and C++   | ➤ Types of Application JAVA  |
| ➤ JAVA History and Features   |  |
| <b>Session 2: Installation and First Program</b>  |  |
| ➤ How to install JAVA   | ➤ Difference between applications and applets  |
| ➤ Environment Variables   | ➤ Java Program Development   |
| ➤ JVM Architecture  | ➤ Java Source File Structure   |
| ➤ JDK and its usage (Java Compiler, Java Runtime, Java Debugger, Java doc)  | ➤ Java program compilation & execution (Via. cmd and Eclipse)  |
| <b>Session 3: Basics of Java Programming</b>  |  |
| ➤ Data types, Variables, Keywords and Identifiers   | ➤ Operators, Expression, Naming Convention in Java   |
| <b>Session 4: Control Flow</b>  |  |
| ➤ Selection Statements: Simple if statement, The if-else statement, The switch statement, Nesting of selection statements | ➤ Iteration Statements (The while statement, The do-while statement, The for(;;) statement, The foreach statement) |
| ➤ Transfer Statement, The break statement   | ➤ Labeled Statement, The continue statement  |
| <b>Session 5: Arrays</b>  |  |
| ➤ Defining an Array   | ➤ Multi-Dimensional Array  |
| ➤ Initializing & Accessing Array  | ➤ Jig-Jag Array & Command Line Arguments   |
| <b>Session 6: java.lang Package</b>   |  |
| ➤ System class (Taking input from console)  | ➤ Object class   |
| ➤ Math class (How to generate a random number)  | ➤ String, StringBuilder, StringBuffer and StringTokenizer  |
| ➤ Wrapper classes   |  |
| <b>Session 7: OOPS Concepts</b>   |  |
| ➤ Class, object and instances   | ➤ OOPS and its benefits  |
| ➤ Access Specifies, Static Keyword, Constructors and Chaining using this()  | ➤ Polymorphism (Overloading & Overriding)  |
| ➤ Encapsulation and Interfaces  | ➤ Garbage Collection, Object Lifetime  |
| ➤ Initialization Blocks   | ➤ Memory Management  |
| ➤ Inner classes (Member inner class, static inner class, local inner class and Anonymous inner class)                     | ➤ Inheritance, The super keyword, The "this" keyword, Non-static/instance members and functions                    |
| ➤ Abstraction, Abstract classes   | ➤ Reachable Objects, Package   |
| ➤ Organizing Classes and Interfaces in Packages   | ➤ Packages as Access Protection, Defining Package  |
| ➤ CLASSPATH setting for Packages  | ➤ Compilation of package classes   |
| <b>Session 8: Exception Handling</b>  |  |
| ➤ Exceptions & Errors   | ➤ Exception Handling mechanism   |

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| ➤ Types of Exception & Exception classes                             | ➤ Creating your own Exceptions   |
| ➤ Use of try, catch, finally, throw, throws in Exception Handling    |  |
| <b>Session 9: File &amp; Stream Handling (java.io package)</b>       |  |
| ➤ Input and Output, The File Class                                   | ➤ Byte Streams, Character Streams  |
| ➤ Object Serialization   |  |
| <b>Session 10: Multithreading</b>                                    |  |
| ➤ Multithreaded programming in Java                                  | ➤ Multithreading: advantages and issues  |
| ➤ Java.lang.Runnable and java.lang.Thread                            | ➤ Thread Creations, Thread Life Cycle  |
| ➤ Life Cycle Methods, Synchronization                                | ➤ Wait(), notify(), notifyall() methods  |
| <b>Session 11: Collections and Maps</b>                              |  |
| ➤ Java Generics  | ➤ Introduction to Collection   |
| ➤ Collections classes (Stack, Vector, Hash table, Enumeration)       | ➤ Collection Interfaces and class  |
| ➤ List and Subtypes  | ➤ Map and Subtypes, Set and Subtypes   |
| ➤ Various Utility classes (Date, Time, Calendar, Scanner etc.)       | ➤ Miscellaneous Topics   |
| <b>Session 12: AWT</b>   |  |
| ➤ Introduction to AWT  | ➤ Individual Components Label, Button, CheckBox, RadioButton etc.              |
| ➤ Choice, List, Menu, TextField, TextArea                            | ➤ Layouts, Listeners & Event Handling  |
| <b>Session 13: Swing</b>   |  |
| ➤ Introduction to Swing  | ➤ Difference between AWT and Swing   |
| ➤ Components Hierarchy   | ➤ Panes, JScrollPane, JTable   |
| ➤ Individual Swing Components JLabel, JButton, JTextField, JTextArea | ➤ Listeners and Event Handling   |
| <b>Session 14: Applet</b>  |  |
| ➤ The Applet Class   | ➤ Passing Parameters, embedding in HTML  |
| ➤ Applet Context, paint(), repaint(), update(), getGraphics()        | ➤ Integrating into distributed application                                     |
| ➤ Running applet using command prompt                                |  |
| <b>Session 15: Networking</b>  |  |
| ➤ Introduction to Networking   | ➤ TCP/IP and UDP   |
| ➤ Socket and ServerSocket  | ➤ Client – Server Communication  |
| ➤ URL, InetAddress etc.  | ➤ Datagram Packet & Datagram Socket  |
| <b>Session 16: Reflection API</b>                                    |  |
| ➤ Introduction to Reflection API                                     | ➤ Reflection methods to get information about class modifiers, fields, methods |
| ➤ Constructors, super classes etc.                                   |  |
| <b>Session 17: End Project Development</b>                           |  |
| ➤ Requirement Analysis, Testing                                      | ➤ Designing, Working with Packages   |
| <b>Session 18: JDBC</b>  |  |
| ✓ Introduction   | ✓ Statement & ResultSet  |
| ✓ JDBC Architecture  | ✓ PreparedStatement & Connection   |
| ✓ Types of Drivers   | ✓ Save Point & Batch Updates   |

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| ✓ CallableStatement and BLOB & CLOB                                    | ✓ Project Development   |
| <b>Session 19: JAVA Mail</b>   |   |
| ✓ Introduction to JAVA Mail  | ✓ Configuring JAVA Mail API & sending   |
| <b>Session 20: Servlet</b>   |   |
| ✓ Introduction: What and Why?  | ✓ Web Server & Containers   |
| ✓ Web Application Architecture   | ✓ Http Protocol   |
| ✓ Web Application Development  | ✓ Understanding Servlet API   |
| ✓ Html-Servlet Communication   | ✓ Servlet Life Cycle  |
| ✓ Container Life Cycle   | ✓ Deployment of web application on  |
| ✓ Servlet to DB communication  | ✓ Servlet to Servlet communication  |
| ✓ Session Tracking: Cookies, Hidden Fields, URL Rewriting, HttpSession | ✓ Servlet Filters & wrappers  |
| ✓ Servlet Listeners  | ✓ File Uploading and Downloading  |
| ✓ Annotations based servlet programming                                | ✓ Web-Security  |
| ✓ Project Development  | ✓   |
| <b>Session 21: JSP</b>   |   |
| ✓ Introduction   | ✓ JSP Lifecycle   |
| ✓ JSP Implicit Objects and scopes                                      | ✓ JSP Scripting tags  |
| ✓ JSP Directive tags   | ✓ JSP Action: Standard Actions, Custom  |
| ✓ JSP Using JavaBeans JSTL   | ✓ Custom Actions and Tag Libraries in   |
| ✓ JSP with AJAX  | ✓ Understanding MVC architecture  |
| ✓ Implement MVC based web application using servlet, JSP, JavaBeans    | ✓ Session Tracking-Cookies, Hidden form fields, URL Rewriting and HttpSession                   |
| ✓ Project Development  |   |
| <b>Session 22: EJB &amp; RMI</b>                                       |   |
| ✓ Overview on the JAVAEE Architecture-1,2,3                            | ✓ The EJB Model   |
| ✓ The Services of the Application Server                               | ✓ Developing Session Beans- Stateless Session Beans, Stateful Session Beans, Packaging, Writing |
| ✓ Introduction to RMI  | ✓ RMI execution flow  |
| ✓ RMI with database  | ✓ Project Development   |
| <b>Session 23: Hibernate</b>   |   |
| ✓ Hibernate Introduction   | ✓ Hibernate Architecture  |
| ✓ Understanding First Hibernate  | ✓ Hibernate with annotation   |
| ✓ Hibernate with web application                                       | ✓ Hibernate Generator classes   |
| ✓ Hibernate Dialects   | ✓ Hibernate Configuration & Mapping   |
| ✓ Hibernate relations-One to One, One to Many, Many to One, Many       | ✓ HQL(Hibernate query language)   |
| <b>Session 24: Struts</b>  |   |
| ✓ Introduction: What and Why?  | ✓ Struts Architecture   |
| ✓ Steps to create Struts 2 Application                                 | ✓ Understanding Action Class  |

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| ✓ Understanding struts.xml, web.xml files                           | ✓ Core Components- Interceptors, Action Invocations, Action Interface, ActionSupport Class |
| ✓ Building web pages using Struts 2 and Servlet                     | ✓ Struts with Hibernate  |
| ✓ Project Development   | ✓ Abstract classes   |
| <b>Session 25: Spring</b>   |  |
| ✓ Why Spring?   | ✓ Overview of Spring 3 Architecture  |
| ✓ Spring modules overview   | ✓ Spring MVC Architecture  |
| ✓ Understanding Spring 3 Annotations                                | ✓ Spring Applications  |
| ✓ Multiple Controller   | ✓ Request Response   |
| ✓ MVC Form example  | ✓ MVC CRUD example   |
| ✓ Deployment of web application using Spring MVC module             | ✓ Integration of Spring module with Hibernate  |
| ✓ Web services using Spring   | ✓ Project Development  |
| <b>Session 26 Project Development</b>                               |  |
| ✓ Requirement Analysis  | ✓ Designing Database   |
| ✓ Designing Templates   | ✓ Make your project Dynamic with J2EE  |
| ✓ Working with MVC Architecture                                     | ✓ Hosting of Project   |
| ✓ Working with FTP  | ✓ Debugging with developer tools of  |
| ✓ Testing   |  |
| <b>Session 27: SpringBoot</b>                                       |  |
| ➤ What is Micro Service, Prerequisites                              | ➤ What is Spring Boot, How does it work  |
| ➤ Spring Boot Starters, Auto Configuration, Spring Boot Application | ➤ Spring Initializer, Class Path Dependencies, Main Method, Write a Rest Endpoint          |
| ➤ Create an Executable JAR  | ➤ Run Hello World with Java  |
| ➤ Dependency Management   | ➤ Maven Dependency   |
| <b>Session 28: Building Restful Web Services</b>                    |  |
| ➤ Rest Controller, Request Mapping                                  | ➤ Request Body, Path Variable  |
| ➤ Request Parameter   | ➤ Restful APIs   |
| <b>Session 29: ThymeLeaf</b>  |  |
| ➤ Thymeleaf Templates   | ➤ Web Application  |
| <b>Session 30: Database Handling</b>                                |  |
| ➤ Introduction to MongoDB and NoSQL                                 | ➤ Introduction to JSON/BSON  |
| ➤ Data Modeling in MongoDB  | ➤ Backup Strategies  |
| ➤ Advantages of NoSQL over SQL                                      | ➤ MongoDB Security Concepts  |
| ➤ Connection to MongoDB   | ➤ SpringBoot MongoDB Document File   |