

## Java Programming Language

<b>Course Name</b>	Java Programming Language
<b>Course Description</b>	<p>The Java Programming Language course is designed for programmers that are familiar with object-oriented concepts and want to learn how to develop Java technology applications.</p> <p>The course covers the Java platform (Java SE 6) and the Java syntax while emphasizes best practices and proper OOP approach.</p> <p>The material covered is demonstrated and practiced through intensive programming exercises.</p>
<b>Target Population</b>	<ul style="list-style-type: none"> <li>● O.O developers moving to Java.</li> </ul>
<b>Pre-requisites</b>	<ul style="list-style-type: none"> <li>● Practical experience in any object-oriented programming language (e.g. C++)</li> </ul>
<b>Course Topics</b>	<p><b>Module 1 - Introduction to Java</b></p> <ul style="list-style-type: none"> <li>○ Java History</li> <li>○ Language features</li> </ul> <p><b>Module 2 - The Java Environment</b></p> <ul style="list-style-type: none"> <li>○ Java Virtual Machine</li> <li>○ First Java Program</li> <li>○ Java compiler</li> <li>○ Garbage collection</li> <li>○ Installation and distribution</li> </ul> <p><b>Module 3 - Java Syntax</b></p> <ul style="list-style-type: none"> <li>○ Comments</li> <li>○ Variables</li> <li>○ Primitive types</li> <li>○ Operations</li> <li>○ Flow control</li> <li>○ Strings</li> <li>○ Arrays</li> </ul> <p><b>Module 4 - Java Class Definition</b></p> <ul style="list-style-type: none"> <li>○ Methods</li> <li>○ Constructors</li> <li>○ Encapsulation</li> <li>○ <i>static</i> and <i>final</i> variables</li> <li>○ Javadoc</li> <li>○ Objects references</li> <li>○ The <i>this</i> keyword</li> </ul>

<p><b>Course Topics</b></p>	<p><b>Module 5 - Packages, Jar files, Classpath</b></p> <ul style="list-style-type: none"> <li>o Packages</li> <li>o The import statement</li> <li>o Class loading and CLASSPATH</li> <li>o Package-friendly access</li> <li>o JAR files</li> </ul> <p><b>Module 6 - Inheritance and Polymorphism</b></p> <ul style="list-style-type: none"> <li>o Inheritance in Java</li> <li>o The <i>super</i> keyword</li> <li>o Single inheritance</li> <li>o protected access</li> <li>o Implementing polymorphism</li> </ul> <p><b>Module 7 - Abstract classes &amp; Interfaces</b></p> <ul style="list-style-type: none"> <li>o Abstract classes</li> <li>o Interfaces</li> <li>o Simulating multiple inheritance</li> </ul> <p><b>Module 8 - Advanced Class issues</b></p> <ul style="list-style-type: none"> <li>o Final members and methods</li> <li>o The Object class</li> <li>o Inner classes</li> </ul> <p><b>Module 9 - Error Handling</b></p> <ul style="list-style-type: none"> <li>o The Throwable class</li> <li>o Checked and unchecked exceptions</li> <li>o Multiple <i>catch</i> blocks</li> <li>o Custom exceptions</li> <li>o <i>finally</i> clause</li> <li>o Assertions</li> </ul> <p><b>Module 10 - Strings</b></p> <ul style="list-style-type: none"> <li>o String, StringBuffer, StringBuiler</li> <li>o Wrapper classes</li> <li>o StringTokenizer</li> </ul> <p><b>Module 11 - Data structures</b></p> <ul style="list-style-type: none"> <li>o Java data structures</li> <li>o Iterators</li> <li>o JDK1.1 data structures</li> <li>o Generics</li> </ul> <p><b>Module 12 - Multi Threading</b></p> <ul style="list-style-type: none"> <li>o Java Thread API</li> <li>o The Runnable interface</li> <li>o Threads lifecycle</li> <li>o Synchronization</li> <li>o Wait/notify</li> </ul> <p><b>Module 13 - Java I/O</b></p>
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<b>Course Topics</b>	<ul style="list-style-type: none"> <li>o Streams and Filters</li> <li>o Serialization</li> <li>o Readers and Writers</li> <li>o Working with files</li> <li>o Standard input/output/error</li> </ul> <p><b>Module 14 - Networking</b></p> <ul style="list-style-type: none"> <li>o TCP communication</li> <li>o Sockets and ServerSockets</li> <li>o Simple client-server example</li> </ul> <p><b>Module 15 - JDBC</b></p> <ul style="list-style-type: none"> <li>o JDBC working model</li> <li>o JDBC drivers</li> <li>o Statements</li> <li>o Transactions</li> <li>o Prepared statements</li> <li>o Callable statements</li> </ul> <p><b><u>If Time Permits:</u></b></p> <p><b>Appendix A: Annotations</b></p> <ul style="list-style-type: none"> <li>o Standard annotations</li> <li>o Custom annotation types</li> </ul> <p><b>Appendix B: RMI</b></p> <ul style="list-style-type: none"> <li>o RMI usage</li> <li>o Stubs and skeletons</li> <li>o RMI server example</li> <li>o Deployment and codebase</li> </ul> <p><b>Appendix C: Reflection</b></p> <ul style="list-style-type: none"> <li>o Working with Class objects</li> <li>o Invoking methods and accessing attributes</li> <li>o Reflection security model</li> <li>o Dynamic proxies</li> </ul> <p><b>Appendix D: Java Native Interface</b></p> <ul style="list-style-type: none"> <li>o Invoking native code form Java</li> <li>o Accessing Java from native code</li> <li>o Exceptions and threading issues</li> <li>o CAS COM bridge</li> </ul>
<b>Course Duration</b>	5 Days (40 hours)