Java™ for Advanced Programmers

This intensive, hands-on course explores advanced Java™ 5.0 Standard Edition language features and packages. Students will learn to parse XML documents using the JAXP API. Multi-threaded applications will be covered in detail including concepts such as deadlocks and race conditions. Students will also learn how to utilize more advanced I/O capabilities with object serialization and low-level file I/O with the java.nio package. Client/server applications will be written utilizing both the java.net and java.rmi packages. Additional topics on JNI, performance tuning, and advanced RMI are included as appendices for further study.

Audience: Java programmers who wish to increase their depth of knowledge in Java programming and explore the uses of the various advanced packages.

Prerequisites: *Intermediate Java Programming* or equivalent experience is required.

Number of Days: 3 days

1. Processing XML with Java – JAXP
- The Java API for XML Processing
- Introduction to SAX Parsing
- SAXParser and JAXP
- SAX Event Methods
- Introduction to DOM
- Parsing DOM with JAXP
- The DOM API
- Validation
- Transformation

2. Introduction to Threads
- Non-Threaded Applications
- Threaded Applications
- Creating Threads
- Thread States
- Runnable Threads
- Coordinating Threads
- Interrupting Threads
- Runnable Interface
- ThreadGroups

3. Thread Synchronization and Concurrency
- Race Conditions
- Synchronized Methods
- Deadlocks
- Synchronized Blocks
- Thread Communication — wait()
- Thread Communication — notify()
- Java 5.0 Concurrency Improvements
- Thread-Aware Collections
- Executor
- Callable

4. Advanced I/O - Object Serialization
- What is Serialization?
- Serializable Objects
- Writing an Object
- Reading an Object
- Handling Exceptions
- Customizing Serialization
- Controlling Serialization
- Versioning

5. Advanced I/O – New I/O
- The java.nio package
- Buffers and Channels
- Buffer Implementations
- Buffer Methods
- ByteBuffer Methods
- FileChannel
- File Locking
- MappedByteBuffer
- Transferring Data between Channels
- Character Sets

6. Reflection
- Introduction to Reflection
- The Class Class
- The reflect Package
- Constructors
- Fields