Advanced Java programming – course syllabus

Course length: Three daily sessions, eight hours each.

Course goals: Improve the capabilities of Java developers by drilling down into the JVM, understanding its memory model, concurrency issues and getting familiar with techniques that every developer should know. In addition, Get familiar with newly available SDKs, and go over important dos and don’ts and learn best practices in the world of Java coding.

Target audience: Java developers with at least two years of experience.

Course Methodology: Three daily sessions of about eight hours each. This is the basic daily schedule:

- 09:00-10:30 First session
- 10:30-10:45 Recess
- 10:45-12:00 Second session
- 12:00-13:00 Lunch break
- 13:00-15:00 Third Session
- 15:00-15:15 Recess
- 15:15-17:00 Fourth Session

We believe that only practical hands on experience will help fully understand the material at hand. For this reason each session includes a practical exercise where the actual hands on experience can be gained.

As with all our courses, the content of this course can be personally tailored to your needs and requirements. Content can be removed, added or altered as needed.

Detailed curriculum:

Session 1 – Into the JVM

- Memory management & the Garbage Collector
- Fixing those memory leaks
- Reference Objects
- Performance, Monitoring & Profiling
- Asynchronous I/O

Session 2 – Concurrency – the real business

- Core Java Threading
- Harnessing the power of: java.util.concurrent
- Deep look into concurrency, deadlocks and advanced techniques

Session 3 – Object Oriented in software engineering

- Decoupling
- Reuse
- Encapsulation
- Inheritance
- Polymorphism
- Things that OOP don't cover (introducing AOP)

Session 4 – Design patterns

- Design patterns types
- Singleton
- Factory
- Visitor
- Template Method
- Bridge
- Chain of Responsibility
- Strategy/Algorithm
- Creational Patterns
  - Builder
  - Prototype
  - Factory & Abstract Factory

Session 5 – More patterns

- Structural Patterns
  - Adapter
  - Composite
  - Decorator
  - Façade
  - Flyweight
  - Proxy
- Behavioral Patterns
  - Observer
  - Command
  - Mediator
  - Iterator
  - Memento
  - State
  - Interpreter

Session 6 – Design Principles

- Inversion of Control & Dependency Injection
- Composition vs. Inheritance
- Anti-patterns

Good luck!