Course : Campus Atlas - JAVA, advanced programming

Practical course - 4d - 28h00 - Ref. LCI
Price : 2100 € E.T.

NEW

On completion of the course, participants will be able to use the advanced functions of the Java language in application development projects. This training program is intended for employees of professional branches covered by the OPCO Atlas.

Teaching objectives

At the end of the training, the participant will be able to:

- Master the advanced aspects of the Java language
- Understand how to apply the main Java frameworks and libraries
- Understanding the security model and loading Java classes
- Java programming for relational databases
- Test, debug and optimize your applications
- Get to grips with what's new in Java

Intended audience

Pour les adhérents à l'OPCO Atlas : développeurs, chargés de développement d'applications informatiques, chefs de projet proches du développement.

Prerequisites

Maîtriser le langage Java, connaître les concepts de base de données relationnelles et du langage SQL, disposer d'une expérience en programmation Java.

Practical details

Teaching methods

To optimize the learning experience, e-learning modules can be provided before and after the classroom session or virtual class, at the participant's request.

Course schedule

PARTICIPANTS

Pour les adhérents à l'OPCO Atlas : développeurs, chargés de développement d'applications informatiques, chefs de projet proches du développement.

PREREQUISITES

Maîtriser le langage Java, connaître les concepts de base de données relationnelles et du langage SQL, disposer d'une expérience en programmation Java.

TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more.
Participants also complete a placement test before and after the course to measure the skills they've developed.

1 Java EE - Fundamentals of web development in Java - Pre-training digital learning content

- Introduction.
- Servlets.
- JSP.
- The JDBC API in a web context.
- Complementary notions and conclusion.

Digital activities

This online training course shows how to develop web applications with Java EE 8 using Eclipse and the Tomcat container. Participants will learn how to use servlets, JSPs and connection pools via JDBC to access a database, as well as how to exploit the HTTP/2 protocol. By the end of the course, participants will have mastered the basics of creating a Java EE web application.

2 Introduction to competition

- Multithreading fundamentals.
- Thread creation and life cycle.
- Basic synchronization.
- Classic competition problems.

Hands-on work

Création et gestion des threads. Synchronisation basique.

3 Multithreading fundamentals

- Thread creation.
- Runnable interface.
- Basic synchronization.
- Race conditions.

Hands-on work

Implémentation de threads, synchronisation et détection d'erreurs concurrentes.

4 Competition patterns

- Competing design patterns.
- Deadlock management.
- Best practices.
- Monitoring and debugging.

Hands-on work

Implémentation de patterns. Résolution de deadlocks.

5 Monitoring tools and best practices

- VisualVM.
- JConsole.
- Thread analysis.
- Best practices in competitive development.

Hands-on work

Utilisation d'outils en live. Cas pratique de détection de blocage. Débrief collectif.

TEACHING AIDS AND TECHNICAL RESOURCES

• The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
• At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
• A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@orsys.fr to review your request and its feasibility.

6 Network fundamentals

- Network fundamentals.
- Client/server architecture.
- TCP/UDP protocols.
- Introduction to sockets.

Hands-on work
Configuration des sockets. Communication réseau.

7 Network applications

- Communication patterns.
- Error handling.
- Network security.
- Performance and optimization.

Hands-on work
Sécurisation réseau. Tests et optimisation. Persistance et sécurité.

8 Java RMI (Remote Method Invocation)

- RMI architecture.
- Remote interfaces.
- Remote interfaces.

Hands-on work
Configuration, remote service and firewall diagnostics.

9 Flow assessment and optimization

- Network logs.
- Latency.
- Performance evaluation.

Hands-on work
Profilage réseau. Atelier d'analyse. Présentation de solutions techniques.

10 Introduction to persistence with JPA and Hibernate

- Data models and ORM concepts.
- JPA architecture and configuration.
- Hibernate integration.
- Object-relational mapping.

Hands-on work
Configuration initiale. Création d'entités.

11 Relationships between entities and life cycle

- OneToMany.
- ManyToOne.
- trCascade, transactions.

Hands-on work
Modélisation de schémas. Mise en œuvre de relations complexes. Gestion des suppressions.

12 JPQL and Criteria API queries

- JPQL syntax.
- API Criteria.
- Aggregations.

Hands-on work
Écriture de requêtes. Filtrage multi-critères. Optimisation de jointures.

13 Security and access optimization

- Lazy loading.
- Indexing.
- SQL injection.
- Cache.

Hands-on work
Audit de code JPA. Test de performances. Sécurisation des entrées utilisateurs.

14 Unit and integration testing with JUnit

- JUnit 5.
- Assertions.
- Test suites.
- Code coverage.

Hands-on work
Test sur couche DAO, écriture de classes de test et fixture.

15 Advanced testing with specialized tools

- Mockito (mocking).
- JaCoCo (cover).
- JMeter (load).

Hands-on work
Tests de performance, création de mocks et analyse de rapports de couverture.

16 Performance analysis and code optimization

- Memory profiling.
- Garbage management.
- Collector.
- VisualVM.

Hands-on work
Simulation de fuite mémoire, interprétation de métriques et amélioration ciblée.

17 **Concurrent programming - Multithreading and information processing in Java - Post-training digital learning content**

- What is concurrent programming?
- Java and thread management.
- I/O and asynchronism in Java.
- Servlets and access concurrency.

Digital activities
This online training course introduces the principles of concurrent programming and the use of multithreading in Java for web applications. Participants will learn how to manage and control threads, optimize input/output, and understand how an application server and its contexts work. The course concludes with the creation of a multithreaded invoice management tool.

Dates and locations

REMOTE CLASS
2026 : 24 Mar., 16 June, 29 Sep., 8 Dec.

METZ
2026 : 16 June, 8 Dec.

PARIS LA DÉFENSE
2026 : 17 Mar., 9 June, 22 Sep., 1 Dec.

NANCY
2026 : 24 Mar., 29 Sep.