Course : Campus Atlas - Spring, developing enterprise applications

Practical course - 5d - 35h00 - Ref. LDG
Price : 2610 € E.T.

Spring is an essential framework for developing enterprise applications in Java. This training course offers a comprehensive and practical approach to mastering Spring, Spring Boot, data management, security and the creation of modern APIs. This training program is intended for employees in professional branches covered by the OPCO Atlas.

Teaching objectives

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

- Understanding how Spring works
- Good development practices with Spring
- Configuring application components with Spring
- Implement a data access service
- Improving efficiency with Spring Boot
- Securing the application

Intended audience

For OPCO Atlas members: Java developers, Java SE/Java EE architects, technical project managers.

Prerequisites

Good knowledge of Java.

Practical details

Hands-on work

Discussions, practical work.

Teaching methods

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

Course schedule

PARTICIPANTS

For OPCO Atlas members: Java developers, Java SE/Java EE architects, technical project managers.

PREREQUISITES

Good knowledge of 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
- Additional information and conclusion

Digital activities

In this online training course, you'll discover how to develop web applications with Java EE 8 using Eclipse and the Tomcat container. You'll 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, you'll have mastered the basics needed to create a Java EE web application.

2 Introduction to Spring and Spring Boot

- Spring Framework architecture and components.
- Inversion of control (IoC) and dependency injection.
- Spring Boot configuration and autoconfiguration.
- Profiles and application properties.
- DevTools and actuators for development.
- Good configuration practices.

3 Configuration and dependency injection

- Java configuration versus XML versus annotations.
- Bean and lifecycle management.
- Configuration profiles.
- Injection types (constructor, setter, field).
- Solving circular dependencies.
- Spring bean scopes.

Hands-on work

Configurer des beans, injecter des dépendances, tester et valider.

4 AOP and cross-functional programming

- PDO concepts.
- Cutting points and tips.
- Pointcut expressions.
- Logging aspects.
- Transaction management.
- Customized aspects.

Hands-on work

Introduction à l'AOP. Implémenter des aspects, optimiser et revoir.

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.

5 Summary and best practices

- Good configuration practices.
- Spring architecture patterns.
- Questions and answers.
- Preparing for data persistence.
- Spring design patterns and architecture.
- Good safety practices.
- Performance optimization.
- Deployment strategies.
- DevOps and continuous integration.
- Evolution and maintenance.
- Resources and community.

Hands-on work
Revue des conceptsn, quiz et évaluation. Cas d'usage pratiques.

6 Persistence with Spring Data JPA

- Configuring persistence with JPA.
- Object-relational mapping (ORM).
- Repositories Spring Data.
- Query methods and derived queries.
- Configure relationships between entities.
- Inheritance and mapping strategies.

Hands-on work
Configurer JPA. Mapping et repositories. Tests d'intégration.

7 Queries and data manipulation

- Query methods and query derivation.
- Native JPQL and SQL queries.
- Projections and DTO.
- Pagination and sorting of results.
- Specifications and dynamic criteria.

Hands-on work
Query Methods, projections et pagination, critères dynamiques.

8 Transaction management

- Transaction configuration.
- Propagation and insulation.
- Error handling.
- Distributed transactions.

Hands-on work
Configuration transactionnelle, services transactionnels, gestion des erreurs.

9 Performance and optimization

- Lazy loading and eager fetching.
- Caching with Spring.
- Query optimization.
- Monitoring and profiling.
- Good performance practices.

Hands-on work
Stratégies de chargement, cache et monitoring, review des optimisations.

10 REST architecture with Spring MVC

- REST architecture principles.
- Spring MVC (Model, View, Controller) and controllers.
- REST mappings and endpoints.
- Content negotiation.
- HTTP error handling.
- Data validation.

Hands-on work
Introduction aux API REST, conception d'API, design review.

11 Controller implementation

- @RestController and annotations.
- HTTP methods and mappings.
- Query parameters.
- Serialization/deserialization.
- REST endpoint testing.

Hands-on work
Développement des contrôleurs, paramètres et sérialisation, tests d'intégration.

12 Documentation and testing

- OpenAPI (Swagger) documentation.
- REST integration testing.
- API testing tools.
- API versioning.

Hands-on work
Documentation OpenAPI, tests avec Postman, tests d'intégration.

13 Reactive programming with WebFlux

- Principles of reactive programming.
- Project Reactor.
- WebFlux versus MVC.
- Flux and Mono.
- Reactive operators.
- Reactive tests.

Hands-on work
Introduction à la programmation réactive, implémentation WebFlux, revue et optimisation.

14 Web applications with Spring MVC

- MVC architecture in Spring.
- Spring MVC controllers.
- View management.
- Templating with Thymeleaf.
- Form validation.
- Static resource management.

Hands-on work
Setup du projet MVC, développement des vues, intégration et tests.

15 Security with Spring Security

- Spring Security configuration.
- Authentication and authorization.
- User management.
- Endpoint protection.
- CORS and CSRF.
- Session security.

Hands-on work
Configuration de base, gestion des autorisations, sécurisation des endpoints.

16 Safety tests

- Safety tests.
- Mocking users.
- Secure integration testing.
- Security audit.

Hands-on work
Tests d'authentification, tests d'autorisation, audit de sécurité.

17 OAuth2 and JWT

- OAuth2 and OpenID Connect.
- JSON Web Tokens (JWT).
- Authorization Server.
- Resource Server.
- Customer applications.
- Authentication flow.

Hands-on work
Configuration OAuth2, implémentation JWT, review et validation.

18 WebSocket with Spring

- WebSocket protocol and its advantages.
- Spring WebSocket configuration.
- STOMP and messaging.
- SockJS and fallback.
- WebSockets security.
- Real-time communication patterns.

Hands-on work
Configuration WebSocket, messagerie temps réel, tests et validation.

19 Real-time application

- Real-time application architecture.
- WebSocket session management.
- Broadcasting and targeted messages.
- Disconnection and reconnection management.
- Reactive user interface.
- Connection monitoring and supervision.

Hands-on work
Interface utilisateur réactive, gestion des messages, tests et monitoring.

20 Scalability and monitoring

- Horizontal scalability with Spring.
- Message brokers and clustering.
- Application metrics.
- Real-time monitoring.
- System resource management.
- Alerting and reporting.

Hands-on work
Architecture scalable, monitoring applicatif, tests de charge.

21 Apache Maven - Manage your Java projects efficiently - Post-training digital learning content

- Complex Java projects.
- Introducing Maven.
- Maven implementation.
- Dependency management.
- The software construction cycle.

Digital activities
This online training course shows how to create, manage and automate Java projects with Apache Maven. After an introduction to the challenges of Java project management, participants will learn how to install Maven, structure a project, manage dependencies and exploit the various build tasks. Test execution and application packaging will also be covered, to simplify day-to-day development and make it more reliable.

Dates and locations

REMOTE CLASS
2026 : 16 Mar., 8 June, 21 Sep., 30 Nov.

PARIS LA DÉFENSE
2026 : 1 June, 14 Sep., 23 Nov.

METZ
2026 : 21 Sep.

NANCY
2026 : 8 June, 30 Nov.