

# Course : Spring, advanced implementation

Practical course - 3d - 21h00 - Ref. SGV

Price : 1940 CHF E.T.

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This course will enable you to deepen your knowledge of the Spring framework, set up polyglot persistence with Spring Data (on an RDBMS and ElasticSearch), secure web applications with Spring Security and create batch data processing programs with Spring Batch.

## Teaching objectives

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

- ✓ Best practices in data access
- ✓ Creating repositories and managing transactions with Spring Data
- ✓ Securing an application with Spring Security
- ✓ Supervising a Job with Spring Batch

## Intended audience

Java/Java EE developers.

## Prerequisites

Experience in creating applications with Spring or knowledge equivalent to that provided by the course "Spring training, developing enterprise applications (ref. SPG)".

## Practical details

### Teaching methods

Each part of the course will be put into practice through exercises (Java projects).

## Course schedule

### 1 Spring framework retrospective

- Principle of enterprise application design.
- Review of the Spring framework and Spring Boot.
- Extensions to the main framework, including Spring Data, Spring Security, Spring Batch.
- Security settings for a responsive web application.

### PARTICIPANTS

Java/Java EE developers.

### PREREQUISITES

Experience in creating applications with Spring or knowledge equivalent to that provided by the course "Spring training, developing enterprise applications (ref. SPG)".

### 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.

## 2 Accessing data with Spring Data.

- Data source access configuration.
- Defining a repository (JPA, Elasticsearch).
- Reactive repositories for non-blocking data access.
- Writing custom queries: derived queries, @Query annotation.
- Transaction management.
- Exposing repositories with Spring Data REST, presentation of HATEOAS.

### Hands-on work

Writing a data access layer with Spring Data JPA, exposing repositories in REST HATEOAS with Spring Data Rest.

## 3 How to secure your application with Spring Security

- Definition of a user repository.
- Authentication modes: basic, form-based, bearer token.
- Using JWT: defining claims, signing and verifying with an asymmetric key system.
- The OpenID Connect specification, the coupling between Spring Security and an OpenID Connect server (Keycloak).
- Securing routes, methods and views.
- Protection against CSRF attacks.
- Security configuration for a reactive web application.

### Hands-on work

Securing a Spring MVC REST API with an OpenID Connect server and JWT, securing a Spring MVC GUI.

## 4 Batch processing with Spring Batch

- Job definition: parallel, conditional or sequential step execution.
- The different types of step: tasklet step, chunk oriented step.
- ItemReader, ItemProcessor and ItemWriter interfaces.
- Retry strategies.
- Job execution and supervision: startup, shutdown, incident recovery, access to statistics.
- Job testing with Junit.

### Hands-on work

Extract data from a SQL database and export to text files.

## Dates and locations

### REMOTE CLASS

2026: 25 Mar., 3 June, 14 Sep., 2 Dec.

## 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](mailto:psh-accueil@orsys.fr) to review your request and its feasibility.