

Spring Framework with REST & Spring Boot - ToC - 3 days (24 hours)

Course Title	Development using Spring Framework and Spring Boot [2 days for Spring Framework & 1 day for Spring Boot]					
Course Code						
Duration	24 hours / 3 days (8 hours per day)					
Delivery Mode	Instructor lead - classroom session					
Purpose:	The course covers the concepts of the Spring container and demonstrates how to use Spring as a light-weight enterprise framework. It also teaches on microservice development using Spring boot					
Target Audience	The course is targeted for experienced Java Developers and Architects					
Pre-requisites	· Experience in Java 17/21 programming					
	· Knowledge of JDBC and transactions					
	Complete go/TechPrimers -> Sping Boot (Part 1)					
Installation of all required software	Spring Boot - Part 1 Tech Primer https://engineers.jpmmchase.net/tech-primers/tech-primer-spring-boot-part-1/ Vendor trainer WILL NOT know, show or troubleshoot internal tool DevShell installaion.		Ensures every participant has DevShell, IntelliJ up and running the Hello World program of Spring Boot with Java 21, Spring 6, Spring boot 3.x, Maven installed and configured. BEFORE the first day of the class.			
Course Description						
Learning Objectives	Use the Spring Framework to develop Java applications					
	Use dependency injection to set up and configure applications					
	Set up Spring configuration using XML and annotations					
	Use Spring support for JDBC					
	Use Spring support for transactions					
	Use aspect-oriented programming (AOP) to add behavior to objects					
	Develop a basic Web application with Spring MVC					
	Use Spring Security to secure Web applications					
	Integrate with Hibernate using Spring Data JPA					
	Spring Boot and Microservices					
Versions	Java 17/21, Spring 5/6, Spring boot 3.x		PROPOSED (can vary)			
Chapter#	Topic	Details	Theory (min)	Lab (min)	Total min	Total Hours
	DAY-ONE - [Spring Framework part 1]		175	305	480	8
1	Overview of Spring Technology		15	0		
		Overview of Java EE				
		Where Java EE failed				
		Introduction to Spring	15	0		
		Chapter Total Time (min)	30	0	30	
2	Spring Introduction		10	0		
		Spring basics ---Introduction to beans	5	15		
		Inversion of Control and DI	15	20		
		Configuring beans using @Configuration	10	25		
		Chapter Total Time (min)	40	60	100	
3	The Spring Container and API		15	15		
		· ApplicationContext and its usage	5	15		
		o ClassPathXmlApplicationContext, FileSystemXmlApplicationContext, Constructors, Usage	5	15		

		· Bean Scope and Lifecycle	5	5		
		Lifecycle, Lifecycle Callbacks, BeanPostProcessor, Event Handling	5	20		
		· MessageSources	5	5		
		o Defining and Using Resource Bundles, Localization/I18N	5	5		
		XML vs Annotation ---Which one is more adopted	5	15		
		Chapter Total Time (min)	50	95	145	
4	Dependencies and Dependency Injection (DI)		5	5		
		· Dependency Inversion, Dependency Injection (DI) in Spring, DI Configuration - XML, @Resource	10	30		
		· Stereotypes: @Component, @Service, @Controller, @Repository	5	40		
		· Autowiring	5	15		
		o @Autowired on setters, constructs, methods, fields	10	20		
		o Injecting resources like ApplicationContext	10	20		
		o Fine tuning with @Qualifier	10	20		
		Chapter Total Time (min)	55	150	140	
	DAY-TWO [Spring Framework part 2]		144	336	480	8
		Chapter Total Time (min)	15	45	60	
6	Spring JDBC using H2 database		5	10		
		· DAO Support in Spring	4	15		
		· DataAccessException	4	10		
		· Using DataSources	4	14		
		· DAO Templates	5	9		
		· DAO Templates and Callbacks	4	15		
		· Using Spring with JDBC	5	10		
		· Writing Data with JdbcTemplate	4	10		
		· Reading Data with JdbcTemplate	4	8		
		· Reading Single-Row Scalar Data	5	10		
		· CRUD operations	4	15		
		Chapter Total Time (min)	48	126	174	
7	Spring Integration with Hibernate					
		· Quick introduction to ORM with Hibernate	5	10		
		· Benefits of using Spring with Hibernate	5	10		
		· Hibernate configuration in Spring	5	10		
		· Exception handling	5	10		
		Chapter Total Time (min)	20	40	60	
7	Spring Transactions		0	5		
		· Introduction to Spring Transaction Management	7	10		
		o Overview, Component TX Model, TX Propagation, Declarative Transactions, TransactionManagers	5	12		
		· Using Spring Transactions	6	12		
		· Annotation Configured Transactions	5	5		
		o @Transactional and its settings	30	12		
		o Defining the TX advisor	5	10		
		Chapter Total Time (min)	45	88	133	
5	Aspect-Oriented Programming		6	10		
		· Overview of AOP	4	10		
		o AOP Basics, Aspect, Joinpoint, Advice, Pointcut	12	16		
		· Introduction to Spring AOP	5	12		

		o Capabilities, Configuration (Annotation Based and XML), Weaving, Joinpoints	5	12		
		Using Aspects	14	14		
		o Defining Advice, Configuring Pointcuts, Targets and Proxies	6	10		
		o XML Configuration with <aop>	6	12		
		o AspectJPointcuts, Autoproxies	10	10		
		Using @AspectJ Annotations	10	14		
		o @AspectJ Annotations, Declaring Advice	8	12		
		Chapter Total Time (min)	86	132	218	
8	Spring MVC		0	14		
		Integrating Spring with Java EE Web Apps, ContextLoaderListener, WebApplicationContext	3	8		
		Spring Web MVC Capabilities, Architecture	5	10		
		Spring MVC	5	10		
		o DispatcherServlet, Configuration, mvc Namespace	5	10		
		o Controllers, @Controller, Handler Methods	5	10		
		o @RequestParam and Parameter Binding	5	10		
		o CORS Support	6	12		
		o Writing Controllers, @Controller, @RequestMapping, @RequestParam, @PathVariable	7	8		
		o Introduction to @RestController	5	15		
		o Session Attributes, @SessionAttributes	5	15		
		Chapter Total Time (min)	51	122	173	
9	Spring Security					
		Overview - Capabilities, Architecture	5	5		
		Introduction to Spring Security	5	5		
		o HTTP Security	5	5		
		o Method Security	5	5		
		o Annotation-Based Security	5	15		
10	Spring Batch	Introduction				
11	Spring Flow	Introduction				
12	ReST/HTTP integration	Introduction				
		Chapter Total Time (min)	25	35	60	
	DAY-THREE [Spring Boot]		135	345	480	8
13	Spring Boot	Spring Boot basics	10			
		Spring Boot features: Auto configuration, component scan, Devtools, and embedded servers	15	30		
		Spring Boot data JPA: Data JPA basics, crud repositories, custom methods, and custom queries	10	45		
		API documentation: Swagger	15	20		
		Deployment: Jar building	5	5		
		Additional tools and techniques: Lombok,	5	5		
		Unit testing: Junit and integration testing	30	60		
		Spring Cloud: Spring Config server,	5	30		
		Gateway Service	5	30		
		Eureka server	5	30		
		Microservice tracing: Sleuth tracing	15	30		
		Microservices security: JWT	15	60		