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Second Floor and Third Floor, 5/3 BEML
Layout, Varathur Main Road, Kundalahalli
Gate, Bengaluru, Karnataka 560066
www.traininginbangalore.com



info@tibacademy.com



+91 9513332306



Overview of Spring Technology

- Shortcomings of Java EE, Spring Architecture

Spring Introduction

- Managing Beans, The Spring Container, IoC, DI
- Configuration Metadata – XML, @Component, Auto-Detecting Beans

Dependencies and Dependency Injection (DI)

- Dependency Inversion, Dependency Injection (DI) in Spring, DI Configuration – XML, @Resource

Working with Bean Properties

- Configuring Value Properties, Property Conversions, Setter / Constructor Injection

Spring Expression Language for Configuration

- Configuring and using lists, sets, etc.

Additional Capabilities

- Factory Methods, Bean Aliases, Definition Inheritance (Parent Beans)

The Spring Container and API

- ApplicationContext
- ClassPathXmlApplicationContext, FileSystemXmlApplicationContext, Constructors, Usage





- Resource Access – Overview, Resource Implementations
- Validation
- Overview, JSR-303
- Declarative Validation, @NotNull, @Size, @Min, etc
- Configuration, Injection
- Bean Scope and Lifecycle
- Bean Scope Defined, Configuring, Inner Beans, Bean Creation Lifecycle, Lifecycle Callbacks

BeanPostProcessor, Event Handling

- MessageSources
- Defining and Using Resource Bundles, Localization/I18N

Annotation Driven Configuration

Stereotypes: @Component, @Service, @Controller, @Repository

Java EE 5 Annotation Support

Defining Custom Annotations

Autowiring

Java Based Bean Metadata (JavaConfig)

Overview – code-centric Configuration

@Configuration, @Bean, and @Value

Importing and @Import





- Autowiring in Configuration Classes
- Mixing XML Configuration and @Configuration
- XML vs Annotation Based Configuration
- Other Capabilities
- SpEL – Spring Expression Language
- Validation

Database Access with Spring

- Issues with JDBC / Typical JDBC Flow
- Introduction to Spring DAO Support
- Spring Database API, (Simple)JdbcTemplate, (Simple)JdbcDaoSupport, DataSources,
- Working With and Configuring, <list>, <set>, With Bean Refs, <map>, <props>
- Queries and Inserts
- RowMapper, ParameterizedRowMapper, Passing Arguments, queryForObject, query, update
- Additional API Capabilities
- Additional query methods, Passing Type Arguments, queryForList, FetchSize, MaxRows
- Using Spring with Hibernate





- Overview of Template Approach, SessionFactory configuration
- Using Contextual Sessions
- Using Spring with JPA
- LocalEntityManagerFactoryBean,
LocalContainerEntityManagerFactoryBean,
JNDI,PersistenceUnitManager
- DAO Support – @PersistenceUnit, @PersistenceContext

Aspect Oriented Programming (AOP)

- Overview of AOP
- AOP Basics, Aspect, Joinpoint, Advice, Pointcut
- Introduction to Spring AOP
- Capabilities, Configuration (Annotation Based and XML),
Weaving, Joinpoints
- Using Aspects
- Defining Advice, Configuring Pointcuts, Targets and Proxies
- XML Configuration with <aop:>

AspectJ Pointcuts, Autoproxies

- Using @AspectJ Annotations





Spring Transaction (TX) Management

- Intro to Spring Transaction Management
- Overview, Component TX Model, TX Propagation, Declarative Transactions, TransactionManagers
- Using Spring Transactions
- Annotation Configured Transactions
- @Transactional and its settings
- XML Configured Transactions
- new <tx:*> elements, Configuring tx:advice, and tx:attributes
- Defining the TX advisor

Introduction to Spring Web Integration and Spring MVC

- Integrating Spring with Java EE Web Apps, ContextLoaderListener, WebApplicationContext
- Spring Web MVC Overview, Capabilities, Architecture
- Spring MVC Basics
- DispatcherServlet, Configuration, mvc Namespace
- Controllers, @Controller, Handler Methods
- @RequestParam and Parameter Binding
- View Resolvers
- Writing Controllers, @Controller, @RequestMapping, @RequestParam, @PathVariable
- Forms and Binding, Spring Form Tags, @ModelAttribute





Overview of Spring Security

- Overview – Capabilities, Architecture
- Introduction to Spring Security
- HTTP Security
- Method Security
- Annotation-Based Security
- Expression-Based Access Control
- Authentication Providers





Other Activities

Assessments

- Objective Assessments

- Syntactical based

- Scenario based

Note: At least 2 objective based assessments in each module

- Hands On – Practical Assessments

- Scenario based

Note: At least 2 Hands on assessments in each module

Assignments

- Hands On – Practical Assignments

Note: At least 4 Hands on assignments in each module

Tasks – Home Work

- Regular tasks on each module

Note: Tasks are focused more to improve self learning

Resume Support & Interview Preparation

- Work on one or two mini projects

- Discuss and convert the current working project into Spring project to add in resume & to explain Spring experience in interviews