Backend Development with Java

"Java EE & Spring Boot"

Detailed Course Syllabus

Instructor:	*© Elvin Taghizade*
Duration:	*2 months*
Lesson time:	*3 times a week, 2 hours each lesson*

A. Fourth Part - Java EE & Spring Boot

1. Introduction into Web development
   a. How does the internet work?
   b. Hosting, OSI, TCP/IP models
   c. Browsers, HTTP(s), DNS
   d. HttpRequest, HttpResponse
   e. Server, Handler, Mapping, Servlet
   f. Basic app with Java EE

2. Spring Framework, Spring Boot
   a. Inversion of Control (IoC), ApplicationContext
   b. Dependency Injection (DI) strategies
   c. Spring vs Spring Boot
   d. Migrating from Java EE to Spring Boot (demo)
   e. Conventional project structure
   f. Spring Beans and Bean configurations

3. Spring Boot Annotations
   a. @SpringBootApplication
   b. @EnableAutoConfiguration
   c. @SpringBootConfiguration
   d. @ComponentScan, @AliasFor
   e. @Configuration, @Bean
   f. @Controller, @RequestMapping
   g. @GetMapping, @PostMapping, @PutMapping, @DeleteMapping
   h. @ResponseStatus, @ResponseBody, @RestController
   i. @PathVariable, @RequestParam, @RequestBody
   j. @Service, @Repository, @Autowired*
   k. @ConfigurationProperties(prefix="custom")
   l. application.yaml vs application.properties, @Value

4. Project Lombok, Spring Validation
   a. @Setter, @Getter, @ToString, @EqualsAndHashcode - @Data
   b. @NoArgsConstructor, @AllArgsConstructor
   c. @Valid, @Validated
   d. @NotNull, @NotBlank, @NotEmpty
   e. @Min, @Max, @Size, @Email, @Pattern

5. Global Exception Handling, Logging, Uploading & downloading files
   a. @RestControllerAdvice
   b. @ExceptionHandler
   c. Uploading file (byte[] & Multipart)
   d. Downloading files
   e. @Log42j, ERROR, INFO, DEBUG, TRACE

6. Spring Web
    a. Thymeleaf
    b. Internationalization, Statics & Resources
7. Data Access Layer #1: CRUD operations with JDBC Template
8. Data Access Layer #2: Spring Data JPA, MapStruct bean mapping
    a. What is ORM? Hibernate vs Spring Data JPA
    b. @Repository, JpaRepository
    c. Database connection config via application.yaml
    d. @Table, @Entity, @Id, @GeneratValue, @Column
    e. @Transactional, @Transactional(readOnly = true)
    f. Mapper overview, @Mapper, @Mapping
9. Data Access Layer #3: Relations
    a. @OneToOne
    b. @OneToMany
    c. @ManyToMany
10. Liquibase Database Migration & Versioning
11. Making HTTP Requests, Scheduled Jobs
    a. RestTemplate & FeignClient,
    b. FeignConfig, ErrorDecoder
    c. @Scheduled, @EnableScheduling
    d. fixedRate, fixedDelay, initialDelay, cron expressions
12. Unit Testing, Swagger Documentation
    a. Types of testing
    b. Mockito and JUnit
    c. OpenAPI, SpringFox
13. Spring Security
14. Module 04 Final Project and Exam