

Syllabus – Full Stack Web Development with Java (FSWDJ)

Total Hours: 240 (160 Theory + 80 Practical)

Notes:

1. Lectures and practicals will be combined and delivered simultaneously so that participants will immediately carry out hands-on exercises related to what they learn.
2. The assignments given are expected to be completed by participants of their own time.

Section 1: The Internet – 9 Hours

- IP, TCP, UDP protocols
- Application protocols and port numbers
- Client–server architecture
- DNS, routing, subnet masks, gateways
- NAT, DNAT, firewalls, proxy servers, caches, load balancers

Section 2: World Wide Web (WWW) – 7 Hours

- HTTP/HTTPS protocols
- How browsers and web servers work
- Developer tools usage
- HTML, CSS, JavaScript basics
- Server configuration, telnet, wget, curl

Section 3: Java Programming – 16 Hours

- Data types, control structures, OOP fundamentals
- Exceptions, collections, generics, annotations
- Lambda expressions, multithreading, garbage collection, JVM

Section 4: Object-Oriented Programming – 5 Hours

- Abstraction, Encapsulation, Inheritance, Polymorphism
- Coupling and cohesion
- Identifying classes and objects



Section 5: Test-Driven Development (TDD) – 4 Hours

- JUnit, assertions, lifecycle methods
- Exception testing, JUnit extensions and best practices

Section 6: Development Tools – 5 Hours

- Maven & Maven Wrapper
- VS Code and debugging
- Git and version control

Section 7: Servlets and JSP – 7 Hours

- Servlet API and JSP elements
- Form submission, Filters, Cookies
- Session Management

Section 8: Spring Framework – 6 Hours

- Dependency Injection
- XML and annotation configuration
- Aspect-Oriented Programming (AOP)

Section 9: Relational Databases – 11 Hours

- ER modeling, primary/foreign keys
- Normalization, schema design, SQL
- Transactions, indexes, PostgreSQL

Section 10: Persistence in Java – 7 Hours

- JDBC and connection pooling
- ORM, JPA, Spring Data JPA

Section 11: Spring Web MVC – 7 Hours

- MVC pattern, request handling, data binding
- Form validation, internationalization (i18n)

Section 12: Spring Boot – 8 Hours

- Spring Boot vs. traditional Spring

- Annotations, starters, logging
- Application properties, YAML, profiles

Section 13: Thymeleaf – 8 Hours

- Template engine setup
- Syntax, literals, operations

Section 14: Tailwind CSS – 7 Hours

- Utility-first CSS
- Installation, core classes, layout, responsiveness

Section 15: Spring Security – 6 Hours

- Authentication and authorization

Section 16: Advanced JavaScript – 7 Hours

- Asynchronous JS, functional programming
- Arrow functions, modules

Section 17: React – 8 Hours

- Components, JSX, hooks, routing
- State management, Fetch API, Axios

Section 18: OAuth2 Authorization Framework – 5 Hours

- Roles, grant types, tokens, scopes
- OpenID Connect (OIDC)

Section 19: Microservices Architecture – 4 Hours

- Microservices vs. monolithic systems
- API Gateway, JWTs

Section 20: Building Microservices Applications – 8 Hours

- Spring Boot microservices
- OAuth2 Resource & Authorization Server
- Spring Cloud Gateway



Section 21: Web Application Security – 8 Hours

- Standards and frameworks
- Common vulnerabilities, secure coding, WAFs

Section 22: Application Deployment on Linux Server – 7 Hours

- SSH, file transfers
- Installing Java, PostgreSQL, Nginx
- Reverse proxy, headers, systemd services, logging