



Revision Notes for Backend Software Engineering Class

Introduction to Backend

Overview

Backend development involves creating the server-side logic that powers the applications. The backend is essentially hidden from the user and is responsible for processing the business logic, interactions with databases, authentication, and transactions that users don't see directly [【7:19+handwritten.pdf】](#) [【7:0+transcript.txt】](#).

Backend Components

- **Server Layer (APIs):** This acts as an intermediary between the database and the front end, handling tasks like data validation, processing, and returning responses to the client [【7:17+transcript.txt】](#).
- **Database:** Used for storing application data centrally to ensure consistency, avoid data loss, and facilitate access from multiple devices [【7:1+transcript.txt】](#).
- **Message Queues (e.g., Kafka):** Used for communications between different parts of the system, ensuring smooth and efficient data processing without user involvement [【7:11+transcript.txt】](#).

Why Use a Backend?

- **Centralized Data Storage:** Prevents data loss and redundancy by storing posts, objects, etc., in a database rather than on individual devices [【7:1+transcript.txt】](#).
- **Security:** Mediates access to databases to ensure that sensitive data is not exposed directly to the client side [【7:10+transcript.txt】](#) [【7:17+transcript.txt】](#).



【7:17+transcript.txt】.

Course Expectations

Learning Approach

- Active participation in both theoretical learning and practical lab sessions is crucial.
- Experimentation is encouraged to foster better understanding and retention
【7:18+transcript.txt】 【7:15+transcript.txt】.

Curriculum Overview

The course is structured to provide a comprehensive understanding of backend technologies through weekly modules:

- **Week 1:** Introduction to Version Control Systems (VCS) 【7:0+transcript.txt】.
- **Week 2:** Introduction to APIs, Spring framework, and first microservice
【7:0+transcript.txt】 【7:19+handwritten.pdf】.
- **Week 3:** Database management and Hibernate 【7:0+transcript.txt】.
- **Week 4:** Unit Testing - writing and maintaining tests 【7:0+handwritten.pdf】.
- **Week 5:** Authentication and Authorization, creation of the second microservice 【7:0+transcript.txt】.
- **Week 6:** AWS and deployment processes 【7:0+transcript.txt】.
- **Week 7:** Payment gateways integration 【7:0+transcript.txt】.
- **Week 8-9:** Advanced topics such as Kafka, Redis, Docker, and service discovery 【7:0+transcript.txt】 【7:19+handwritten.pdf】.

Project Development

Key Objectives

- Creation of an e-commerce application backend similar to platforms like Amazon or Flipkart 【7:2+transcript.txt】.



【7:2+transcript.txt】 .

Do's and Don'ts in Development

- **Do's:**

- Regular coding habits and using advanced tools (IDEs, Docker, AWS) 【7:19+handwritten.pdf】 .
- Write unit tests for all code to ensure robustness 【7:14+transcript.txt】 .
- Read a lot of documentation and not shy away from experimentations 【7:19+handwritten.pdf】 .

- **Don'ts:**

- Avoid spoon-feeding; instead, learn to troubleshoot issues independently 【7:8+transcript.txt】 【7:16+transcript.txt】 .
- Eliminate rote memorization; focus on understanding concepts and applying them 【7:19+handwritten.pdf】 .

This structured approach is designed to not only equip learners with the technical skills necessary for backend development but also to instill a problem-solving mindset that is critical for success in the tech industry.