Data24Zone Academy

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CAREER PROGRAM · SYLLABUS · WEB DEVELOPMENT & ARCHITECTURE

System Design: HLD, Scalability & Distributed Systems

Learn to design scalable, fault-tolerant systems — databases, caching, messaging, microservices, and cloud architecture — through real architectural trade-offs, not memorized diagrams.

DURATION	COMMITMENT	LEVEL	FORMATS
8 Weeks	6–8 hrs/week	Advanced	Online Live · Weekend Batch · Self-Paced

Tools & tech stack

Microservices · Caching (Redis) · Message Queues · Load Balancing · Database Sharding · PostgreSQL · Redis · Kafka · Docker · Kubernetes · Claude / ChatGPT

Who it's for

- Developers preparing for system design interviews or designing production architectures

What you'll learn

- Requirement analysis and capacity estimation for real systems
- Database, caching, and messaging design trade-offs at scale
- Microservices, fault tolerance, and API architecture patterns
- A complete system design case study defended end-to-end

Curriculum

01 Part 1: System Design Foundations

- Requirements and Constraints
- Capacity Estimation
- Architecture Communication

02 Part 2: Networking, APIs and Service Design

- Networking and Web Foundations
- API and Contract Design
- Service Boundaries and Integration

03 Part 3: Data Architecture and Storage

- Data Modelling
- Database Selection and Performance
- Caching and Content Delivery

04 Part 4: Performance and Scaling

- Load Balancing and Horizontal Scale
- Queues, Streams and Background Work
- Performance Engineering

05 Part 5: Distributed Systems

- Consistency, Replication and Partitioning
- Time, Identity and Coordination
- Multi-Region Architecture

06 Part 6: Reliability and Operations

- Resilience Patterns
- Disaster Recovery and Data Protection
- Observability and Incident Management

07 Part 7: Security, Privacy and Governance

- Identity and Access Architecture
- Application and Data Security
- Architecture Governance

08 Part 8: Cloud Architecture and Design Interviews

- Cloud and Platform Architecture
- Cost-Sustainable Design and Evolution
- System Design Interview Practice

09 AI Pro

- Using Claude, ChatGPT, and Perplexity to explore architecture trade-offs and challenge your own design
- Verifying an AI-suggested architecture against real constraints before trusting it
- Project: Design and defend a production system, using AI to pressure-test your trade-offs

Projects

- A URL-shortener design with capacity estimation, caching, and database sharding
- A real-time chat system design with WebSockets, message queues, and multi-region considerations
- A written architecture case study defending trade-offs against interview-style follow-up questions