



Best Strategy

- For the next **0-10 months**, master **Java Backend + System Design**.
- After **10 months**, start **DevOps** learning and certification while working.
- By the time you complete **2 years**, you'll have **Java + DevOps skills**,



Your Time Availability

Day	Time Slot	Study Hours
Weekdays	8 PM – 12 PM	4 hrs/day
Weekends	10 AM – 1 PM, 3 PM – 6 PM	6 hrs/day



Phase

Phase 1 (0-10 months): Master C Backend (4 Month's) + System Design (3 Month's)

- Deep dive into **C, C++**, Spring Boot, Hibernate, Microservices.
- Improve **Data Structures and Algorithms (DSA)**.
- Learn **System Design (Scalability, Caching, Load Balancing)**.

: Phase 2 (10-15 months): Start Learning DevOps

- Learn **Linux & Shell Scripting**.
- Learn **Git, GitHub Actions, Jenkins (CI/CD)**.
- Master **Docker & Kubernetes**.
- Learn **Cloud (AWS, Azure, or GCP)**.
- Work on **infrastructure automation using Terraform**.

Phase 3 (15-24 months): Advanced DevOps & Certification

- Get **AWS DevOps Certification**.
- Learn **Logging & Monitoring (Prometheus, Grafana, ELK Stack)**.
- Work on **High Availability & Security in Cloud**.

DSA

⚡ PHASE 1 – DSA + C/C++ + System Design (Apr–Aug 2025)

🎯 Focus:

- Problem-solving with C/C++
- Mastering DSA with LeetCode/Codeforces
- Understanding real-world System Design

📅 Monthly Breakdown

Month	Topics
Apr 2025	C/C++ basics, Memory, Pointers, Functions, Loops
May 2025	Arrays, Strings, STL (vector, map), Sorting, Searching
Jun 2025	Linked List, Stack, Queue, Recursion
Jul 2025	Trees, Graphs, BFS, DFS, HashMaps
Aug 2025	Dynamic Programming, Greedy, Backtracking
Daily 1 to 2 hours	System Design (HLD, LLD), Scalability, Load Balancer, Caching, HLD Qs

⌚ Month-by-Month Deep Breakdown

◆ Month 1 – Core Basics + Arrays/Strings

- Time/Space Complexity
- Sorting Algorithms (Bubble, Merge, Quick)
- Searching (Binary, Linear)
- Arrays (Kadane's, Prefix Sum, Two Sum)
- Strings (Palindrome, Anagram, Substring)

Practice:

LeetCode Easy/Medium, Striver Sheet (Week 1–2), NeetCode 150 Easy

◆ Month 2 – Linked List, Stack, Queue, Recursion

- Singly & Doubly Linked List
- Fast & Slow Pointer
- Stack (Balanced Parenthesis, Min Stack)
- Queue, Circular Queue, Deque
- Recursion & Recursion Tree

Practice:

Linked List cycles, K Reverse, Reverse in group

Stack-based expression, Queue reversals

◆ Month 3 – Hashing, Binary Search, Sliding Window

- HashMap, HashSet, Frequency maps
- Binary Search in 1D, 2D, Sorted Rotated Array
- Sliding Window (Max Sum, Longest Substring)
- Two-Pointer, Prefix Sum

Practice:

LC Top Interview Qs: Subarray Sum, Kth Missing Number, Anagram group

◆ Month 4 – Trees, BST, Heaps, Tries

- Binary Tree Traversals (In, Pre, Post, Level)
- Binary Search Tree Insert/Delete
- Lowest Common Ancestor
- Max Heap, Min Heap (Priority Queue)
- Tries (Word Insert/Search)

Practice:

TreeDiameter, Heap Median, Kth Largest Element

◆ Month 5 – Graphs & Algorithms

- Graph Representations (Adjacency List/Matrix)
- BFS, DFS
- Topological Sort (Kahn's Algo)

- Cycle Detection (Directed/Undirected)
- Union-Find (DSU)
- Shortest Path (Dijkstra, Floyd Warshall)

Practice:

Number of Islands, Course Schedule, MST, Kruskal, Bellman-Ford

◆ **Month 6 – Dynamic Programming + Advanced Topics**

- Memoization, Tabulation
- Knapsack, LIS, LCS
- Matrix DP, Bitmask DP
- Greedy Algorithms
- Backtracking (N-Queen, Sudoku)
- Recap System Design Basics (1–2 hrs/week)

Practice:

DP Patterns (0/1 Knapsack, Subset Sum, House Robber, MCM)

End DSA

System Design



System Design Total Time Needed: 2.5 Months

- Ideal Daily Time:** ~1 hour on weekdays, ~3–4 hours on weekends
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System Design Roadmap – Beginner to Intermediate

- ◆ **Phase 1: Foundations (1st – 3rd Week)**

Week	Topics	Outcome
Week 1	What is System Design? - Horizontal vs Vertical Scaling - Load Balancer - Caching, CDN, DNS	Know system building blocks
Week 2	Networking & Communication - HTTP, REST APIs - Proxies - WebSockets vs Polling	Understand backend traffic flow
Week 3	Databases & Storage - SQL vs NoSQL - CAP Theorem - Sharding, Replication - Consistency Models	Choose right DB for different needs

Resources:

- [Gaurav Sen YouTube](#)
 - [System Design Primer GitHub](#)
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- ◆ **Phase 2: Designing Real Systems (4th – 8th Week)**

Week	Topics	Real Systems to Design
Week 4	Designing Read-heavy Systems - Caching (Redis) - CDN - Write-through / Write-back	Design: Instagram Feed
Week 5	Write-heavy Systems - Queueing systems (Kafka, RabbitMQ) - Rate Limiter (Token Bucket)	Design: Logging System / Chat App
Week 6	Storage/Media Systems - File Storage (S3-like) - Upload/Download architectures	Design: YouTube / Dropbox
Week 7	Search Systems - Indexing, Elasticsearch - Autocomplete - Ranking	Design: Google Search / Flipkart Search
Week 8	Notification Systems - Email, SMS, Push - Pub/Sub Model - Scheduler/CRON	Design: Notification Service / WhatsApp

🛠 Tools:

- Draw diagrams on [Excalidraw](#)
 - Write your designs in Notion/Google Docs
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◆ Phase 3: Scalability Patterns + Mock Interviews (9th – 10th Week)

Week	Topics	Activities
Week 9	Scalability Patterns: - Eventual Consistency - Circuit Breakers - Leader Election - Distributed Caching	Design a Scalable E-Commerce System
Week 10	System Design Interviews: - Practice with friends - Case Studies (Netflix, Uber, WhatsApp)	Mock Design Interviews (peer or mentor)

 **Optional Add-ons Later**

Add-on	Time	Why?
HLD/LLD Basics	1–2 weeks	For system design coding interviews
FAANG Interview Design Questions	2 weeks	Level-up preparation
GCP/AWS Reference Architectures	While doing DevOps Map designs to actual cloud infra	

End System Design

DevOps

⌚ Goal: Master DevOps in 6 Months (Jan 2026 – Jun 2026)

📅 Monthly Breakdown/Index / Curriculum Plan (with Timeline)



#	Phase	Topics / Tools	Outcome / Skills	Duration
1	Foundation	Linux, Git, Networking, Bash	Strong base for DevOps tools	2 Months
2	Version Control	Git + GitHub	CI/CD basics, branching, teamwork	1 Month
3	Cloud Basics	AWS or Azure Fundamentals	Understand core cloud services	1.5 Months
4	Containers	Docker, Docker Compose	Package & run apps as containers	1 Month
5	Kubernetes	K8s basics, minikube, EKS/GKE	Manage, scale, and deploy containers	1.5 Months
6	CI/CD Tools	Jenkins, GitHub Actions, GitLab CI	Build deployment pipelines	1 Month
7	IaC (Infrastructure as Code)	Terraform, CloudFormation	Automate infra using code	1.5 Months
8	Monitoring & Logging	Prometheus, Grafana, ELK Stack	Site reliability and alerts	1 Month
9	Cloud Architecting	AWS Architect / Azure Architect skills	Scale, secure, and design cloud apps	2 Months
10	Security DevOps	IAM, KMS, Security Groups, SAST/DAST	Secure pipelines & infra	1 Month
11	Project + Certification Prep	Real projects + Mock tests	Build portfolio, get certified	3 Months

Phase 1: Core Fundamentals (Month 1-3)

1.1 Linux/Unix & Bash Scripting

Essential for working on servers and automation.

Topics:

- File system structure
- User and group management
- Permissions (chmod, chown)
- Process Management (top, ps, kill)
- Networking Commands (netstat, ss, ping, traceroute)
- Bash scripting:
 - Variables, loops, conditionals
 - Functions
 - Cron jobs
 - Logging

Hands-on:

- Automate a daily log backup script
 - Write scripts to monitor disk usage
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1.2 Git & GitHub

Version control & collaboration

Topics:

- Git installation & configuration
- Repositories, branches, merging
- Stashing, rebasing
- Pull requests
- GitHub Actions (basic CI/CD flows)

Hands-on:

- Create a GitHub repo and push local code
 - Merge multiple branches with pull requests
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Phase 2: Networking + DevOps Basics (Month 2-3)

2.1 Networking for DevOps

Understanding how systems talk to each other

Topics:

- OSI Model
 - TCP/IP, DNS, NAT
 - HTTP/S protocols
 - IP addressing, Subnetting
 - Firewalls, Load Balancers
 - Ports and Protocols
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2.2 DevOps Principles

Core concepts you must understand before diving into tools.

Topics:

- What is DevOps?
 - Agile vs DevOps
 - CI/CD concepts
 - Infrastructure as Code
 - Configuration Management
 - Monitoring & Logging
 - Microservices vs Monolith
 - Containers vs Virtual Machines
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Phase 3: Docker & Containers (Month 4-5)

Topics:

- What is Docker?
- Containers vs Images
- Dockerfile
- Docker Compose
- Docker Volumes & Networks
- Docker Registry (DockerHub, GHCR)
- Containerizing an app (NodeJS + MongoDB)

Hands-on:

- Create Dockerfile for a web app
 - Dockerize MySQL + PHP + Apache stack
 - Push image to DockerHub
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Phase 4: Kubernetes (Month 6-8)

Topics:

- What is Kubernetes?
- Minikube & kubectl setup
- Pods, Deployments, ReplicaSets
- Services (ClusterIP, NodePort, LoadBalancer)
- Volumes and ConfigMaps
- Secrets management
- Helm Charts (optional but useful)

Hands-on:

- Deploy a 2-tier app on local K8s
 - Create Deployment YAML and Services
 - Set up ConfigMap and Secrets
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Phase 5: CI/CD Pipelines (Month 8-10)

Topics:

- Jenkins:
 - Setup
 - Pipelines (Declarative & Scripted)
 - Plugins
 - Webhooks
- GitHub Actions:
 - YAML Workflow
 - Build-Test-Deploy on push
- GitLab CI/CD

Hands-on:

- Create CI/CD pipeline with Jenkins
 - Integrate Docker build + deploy
 - Trigger deploy on GitHub push
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Phase 6: Cloud Platforms (AWS preferred) (Month 10-12)

Topics:

- AWS Core Services:
 - EC2, S3, IAM, VPC
 - RDS, Lambda (optional)
- Deploying web app to EC2
- Load Balancer, Auto Scaling
- AWS CLI + SDK

Hands-on:

- Deploy Docker container on EC2
 - Create S3 bucket for backups
 - Use IAM for secure access control
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Phase 7: Infrastructure as Code (Terraform) (Month 11-13)

Topics:

- Terraform Basics
- Providers & Resources
- Variables & Outputs
- Modules
- Remote State
- Terraform with AWS (EC2, S3, IAM)

Hands-on:

- Deploy EC2 + S3 using Terraform
 - Manage state remotely (using backend)
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Phase 8: Configuration Management (Optional but Useful)

Tools:

- Ansible
- Puppet / Chef (choose any one)

Hands-on:

- Write Ansible Playbook to install Apache + PHP
 - Use roles, handlers, and inventory
-

Phase 9: Monitoring & Logging (Month 13-14)

Topics:

- Prometheus (metrics)
- Grafana (visualization)

- Node Exporter
- ELK Stack (Elasticsearch, Logstash, Kibana)
- Centralized logging from Docker/K8s

Hands-on:

- Monitor app using Prometheus + Grafana
 - Parse logs using Logstash
 - View logs in Kibana dashboard
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Phase 10: Projects, Resume, & Interview Prep (Month 14+)

Capstone Projects:

- CI/CD pipeline with Jenkins + Docker + Kubernetes + AWS
- Full Stack App (Node.js + React) on K8s with Monitoring
- IaC setup using Terraform + AWS

Portfolio Tips:

- Maintain GitHub repo
- Write case studies/blogs
- Deploy personal portfolio

Interview Topics:

- Behavioral (Why DevOps?)
- CI/CD process explanation
- Docker vs VM
- K8s scaling and load balancing
- Terraform state handling
- Logging and monitoring design

Tools & Technologies to Learn

- **Cloud:** AWS (EC2, S3, IAM, VPC, Lambda, RDS, EKS), Azure (VMs, AKS)
 - **CI/CD:** Jenkins, GitHub Actions, GitLab CI
 - **Containers:** Docker, Docker Compose
 - **Orchestration:** Kubernetes, Helm
 - **IaC:** Terraform, Ansible (optional)
 - **Monitoring:** Prometheus, Grafana, ELK Stack
 - **Scripting:** Bash, Python (basic automation)
 - **Version Control:** Git, GitHub
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* Udemy Courses to Follow (Start With These)

1. [Linux Command Line Basics – Udemy]
2. [Git & GitHub Masterclass]
3. [AWS Cloud Practitioner Essentials (Beginner)]
4. [Docker Mastery: Kubernetes + Swarm From a Docker Captain]
5. [Kubernetes for Beginners: Learn K8s from Scratch]
6. [CI/CD with Jenkins: Beginner to Pro]
7. [Terraform for Beginners]



Essential DevOps Learning Timeline (Without Certifications)

Phase	Topic	Usage in DevOps	Key Technologies	Timeline
Beginner	Linux & Shell Scripting	Server management, automation, process control	Linux (Ubuntu, CentOS), Bash, Zsh	Month 1–2
Beginner	Networking & Security Basics	Firewalls, SSH, DNS, VPN, HTTPS, Ports	TCP/IP, DNS, IPTables, OpenVPN, SSL	Month 2–3
Beginner	Git & Version Control	Source code management, collaboration	Git, GitHub, GitLab	Month 2–3
Beginner	CI/CD Basics	Continuous integration & deployment	Jenkins, GitHub Actions, GitLab CI/CD	Month 3–4
Beginner	Cloud Computing Basics	Virtual machines, storage, IAM	AWS, Azure, Google Cloud	Month 3–4
Intermediate	Docker & Containerization	Application packaging, microservices	Docker, Podman	Month 4–5
Intermediate	Kubernetes (K8s)	Container orchestration, scaling, networking	Kubernetes, Minikube, K3s	Month 5–7
Intermediate	Infrastructure as Code (IaC)	Automating infrastructure deployment	Terraform, CloudFormation, Pulumi	Month 6–8
Intermediate	Configuration Management	Automating system configurations	Ansible, Chef, Puppet	Month 7–9
Intermediate	Monitoring & Logging	System health monitoring, debugging	Prometheus, Grafana, ELK Stack	Month 8–9
Advanced	Cloud DevOps	Advanced cloud automation, cost optimization	AWS DevOps, Azure DevOps, GCP DevOps	Month 9–12
Advanced	Site Reliability Engineering (SRE)	High availability, disaster recovery	SLOs, SLIs, Error Budgets, Chaos Eng.	Month 10–12
Advanced	Security & Compliance	DevSecOps, identity & access management	HashiCorp Vault, OWASP, IAM Policies	Month 12+

👉 Complete DevOps Certification Roadmap (Step-by-Step)

● Beginner Level (Months 1–4)

#	Certification	Provider	Description	When to Take
1	AWS Cloud Practitioner	AWS	Intro to AWS Cloud concepts, billing, architecture	Month 3–4
2	Microsoft Azure Fundamentals (AZ-900)	Microsoft	Basic knowledge of Azure services, pricing	Month 3–4
3	Red Hat Certified System Administrator (RHCSA)	Red Hat	Linux administration skills, file systems, user mgmt	Month 4

● Intermediate Level (Months 5–10)

#	Certification	Provider	Description	When to Take
4	Docker Associate (Optional / Udemy)	Docker/Udemy	Docker basics, image, container mgmt	Month 5–6
5	Certified Kubernetes Administrator (CKA)	CNCF	Cluster setup, workloads, networking, RBAC	Month 7–9
6	Certified Kubernetes Application Developer (CKAD)	CNCF	K8s app development, deployments, services	Month 7–10
7	Terraform Associate	HashiCorp	Infrastructure as Code concepts, AWS/GCP provisioning	Month 9–10
8	Oracle Cloud Infrastructure Certified Architect Associate	Oracle	OCI architecture, IAM, networking, compute	Month 9–10

● Advanced Level (Months 11–18)

#	Certification	Provider	Description	When to Take
9	AWS Certified DevOps Engineer – Professional	AWS	End-to-end DevOps lifecycle, CI/CD, security, scalability	Month 14–18
10	Microsoft Certified: Azure Solutions Architect Expert	Microsoft	Enterprise Azure architecture, apps, databases, DevOps	Month 14–18

#	Certification	Provider	Description	When to Take
11	Red Hat Certified Engineer (RHCE)	Red Hat	Advanced Linux automation with Ansible, network services	Month 16–18

● Bonus (Optional but Useful)

#	Certification	Provider	Description	When to Take
12	Linux Foundation DevOps Bootcamp	Linux Foundation	Full-stack DevOps lifecycle, hands-on projects	Anytime (Optional)
13	Oracle Certified Professional (Database Administration 2019)	Oracle	Professional-level Oracle DB Admin	After OCI Associate (Optional)

■ Final Combined Certification Table

Level	Certification	Provider	Ideal Time (Month)	Value
Beginner	AWS Cloud Practitioner	AWS	3–4	Medium
Beginner	Azure Fundamentals (AZ-900)	Microsoft	3–4	Medium
Beginner	RHCSA (Red Hat Certified System Admin)	Red Hat	4	High
Intermediate	Docker Associate / Udemy	Docker/Udemy	5–6	Medium
Intermediate	Certified Kubernetes Administrator (CKA)	CNCF	7–9	Very High
Intermediate	Certified Kubernetes App Developer (CKAD)	CNCF	7–10	High
Intermediate	Terraform Associate	HashiCorp	9–10	Medium
Intermediate	Oracle Cloud Infrastructure Architect Associate	Oracle	9–10	Medium
Advanced	AWS DevOps Engineer – Professional	AWS	14–18	High
Advanced	Azure Solutions Architect Expert	Microsoft	14–18	High
Advanced	Red Hat Certified Engineer (RHCE)	Red Hat	16–18	High

Level	Certification	Provider	Ideal Time (Month)	Value
Optional	Linux Foundation DevOps Bootcamp	Linux Foundation	Any	Good
Optional	Oracle Certified Professional – DB Admin	Oracle	After OCI	Medium

● DevOps Certification Roadmap

Certification	Usage in DevOps	Key Technologies	Timeline	Value
AWS Cloud Practitioner	Cloud fundamentals, AWS billing, architecture	AWS, IAM, EC2, S3	Month 3–4	⭐⭐ (Good for beginners)
Microsoft Azure Fundamentals (AZ-900)	Basics of Azure services, pricing, governance	Azure, IAM, Compute, Storage	Month 3–4	⭐⭐ (Good for cloud beginners)
Red Hat Certified System Administrator (RHCSA)	Linux administration, user & file system management	Linux, Bash, SSH, Firewall, Networking	Month 4	⭐⭐⭐ (Must-have for DevOps)
Docker Associate (Optional / Udemy)	Container basics, image management, networking	Docker, Podman, Containerd	Month 5–6	⭐⭐⭐ (Essential for containerization)
Certified Kubernetes Administrator (CKA)	Kubernetes cluster setup, workloads, networking	Kubernetes, Helm, RBAC, etcd	Month 7–9	⭐⭐⭐⭐ (Core DevOps skill)
Certified Kubernetes Application Developer (CKAD)	Kubernetes app development, services, deployments	Kubernetes, YAML, StatefulSets	Month 7–10	⭐⭐⭐⭐ (For cloud-native development)
Terraform Associate	Infrastructure as Code (IaC) and automation	Terraform, AWS, GCP, Azure	Month 9–10	⭐⭐⭐ (Important for cloud automation)
Oracle Cloud Infrastructure Certified Architect Associate	OCI architecture, IAM, networking, compute	Oracle Cloud, IAM, VCN, Compute	Month 9–10	⭐⭐ (Good for Oracle Cloud-focused roles)

Certification	Usage in DevOps	Key Technologies	Timeline	Value
AWS Certified DevOps Engineer – Professional	End-to-end DevOps lifecycle, CI/CD, security, scalability	AWS, CI/CD, Security, ECS, EKS	Month 14–18	★★★★★ (High-value DevOps certification)
Microsoft Certified: Azure Solutions Architect Expert	Enterprise Azure architecture, apps, databases, DevOps	Azure, DevOps, App Services, Networking	Month 14–18	★★★★★ (Good for Azure DevOps roles)
Red Hat Certified Engineer (RHCE)	Advanced Linux automation with Ansible	Linux, Ansible, Bash	Month 16–18	★★★★★ (Great for automation)

● Other Technology Certifications (Optional but Useful)

Certification	Usage in IT & Development	Key Technologies	Timeline	Value
Linux Foundation DevOps Bootcamp	Full-stack DevOps lifecycle, hands-on projects	Linux, Kubernetes, Jenkins	Anytime (Optional)	★★★ (Comprehensive DevOps learning)
Oracle Certified Professional (Database Administration 2019)	Professional-level Oracle DB Admin	Oracle DB, SQL, PL/SQL	After OCI Associate (Optional)	★★ (Useful for DB-heavy roles)

● Final Learning Timeline for DevOps Certifications

Phase	Certifications to Focus On	Time Required
Beginner (Months 1–4)	AWS Cloud Practitioner, Azure Fundamentals (AZ-900), RHCSA	4 months
Intermediate (Months 5–10)	Docker Associate, CKA, CKAD, Terraform Associate, OCI Architect	6 months
Advanced (Months 11–18)	AWS DevOps Engineer, Azure Solutions Architect, RHCE	8 months

