DevOps & Cloud Solutions Architecture

Complete 12-Month Certification Path

From Beginner to Professional

Duration:	48 Weeks (12 Months)
Study Time:	8 Hours/Week
Certifications:	4 Industry-Recognized Credentials
Projects:	12+ Hands-On Portfolio Projects
Start Date:	November 4, 2025
Target Completion:	October 2026

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Table of Contents

- 1. Executive Summary
- 2. Certification Roadmap
- 3. Phase 1: Foundation (Weeks 1-12)
- 4. Phase 2: Intermediate Skills (Weeks 13-28)
- 5. Phase 3: Advanced Operations (Weeks 29-40)
- 6. Phase 4: Professional Mastery (Weeks 41-52)
- 7. Project Portfolio
- 8. Tools & Technologies
- 9. Learning Resources
- 10. Success Metrics

1. Executive Summary

This comprehensive 12-month learning path is designed to transform you from a beginner into a certified DevOps Engineer and Cloud Solutions Architect. The curriculum combines theoretical knowledge with extensive hands-on practice, preparing you for four industry-recognized certifications and building a portfolio of real-world projects.

Program Highlights:

- Structured 8-hour weekly commitment (weekday evenings + weekends)
- 4 professional certifications: AWS Cloud Practitioner, AWS Solutions Architect Associate, Certified Kubernetes Administrator, and AWS Solutions Architect Professional
- 12+ hands-on projects building production-ready infrastructure
- Progressive learning from cloud fundamentals to advanced DevOps automation
- Practical experience with AWS, Docker, Kubernetes, Terraform, CI/CD pipelines
- Community engagement and professional networking opportunities

2. Certification Roadmap

Timeline	Certification	Cost	Study Hrs	Exam Date
Month 3 (Jan 2026)	AWS Certified Cloud Practitioner	$100	30-40 hrs	Week 12
Month 7 (Apr 2026)	AWS Solutions Architect Associate	$150	60-80 hrs	Week 28
Month 10 (Jul 2026)	Certified Kubernetes Administrator (CKA)	$395	80-100 hrs	Week 40
Month 13 (Oct 2026)	AWS Solutions Architect Professional	$300	100-120 hrs	Week 52

Total Investment: ~$945 in certification fees

ROI: DevOps Engineers earn $100K-150K+ annually

3. Phase 1: Foundation (Weeks 1-12)

Goal: Master cloud fundamentals and earn AWS Cloud Practitioner certification

Month 1: Cloud Computing Basics (Weeks 1-4)

Week 1: Introduction to Cloud & AWS

- Cloud computing concepts (IaaS, PaaS, SaaS)
- AWS global infrastructure
- Setting up AWS Free Tier account
- AWS Management Console navigation
- Lab: Launch first EC2 instance, create S3 bucket

Week 2: Core AWS Services

- EC2 (Elastic Compute Cloud) deep dive
- S3 (Simple Storage Service) and storage classes
- VPC (Virtual Private Cloud) basics
- IAM (Identity and Access Management)
- Lab: Deploy static website on S3

Week 3: Linux Fundamentals

- Linux command line essentials
- File system navigation and permissions
- Process management and system monitoring
- SSH and remote server access
- Lab: Configure EC2 instance as web server

Week 4: Networking Basics

- TCP/IP and OSI model
- DNS, DHCP, and IP addressing
- Security groups and NACLs
- Load balancers and auto-scaling
- Project 1: Multi-tier web application architecture

Month 2: AWS Services & Git (Weeks 5-8)

Week 5: Database Services

- RDS (Relational Database Service)

• DynamoDB (NoSQL)
• Database backup and recovery
• Database security best practices
• Lab: Deploy WordPress with RDS backend

Week 6: Version Control with Git

• Git fundamentals and workflows
• GitHub and repository management
• Branching strategies (Git Flow)
• Pull requests and code reviews
• Lab: Create portfolio GitHub repository

Week 7: Monitoring & Cost Management

• CloudWatch metrics and alarms
• CloudTrail for audit logging
• AWS Cost Explorer and budgets
• Tagging strategies
• Lab: Set up monitoring dashboard

Week 8: Security Fundamentals

• AWS security best practices
• KMS (Key Management Service)
• Secrets Manager
• Security groups and WAF
• Project 2: Secure three-tier architecture

Month 3: Certification Prep (Weeks 9-12)

Week 9: Additional AWS Services

• Lambda and serverless computing
• SNS and SQS messaging
• CloudFront CDN
• Route 53 DNS
• Lab: Serverless application with Lambda

Week 10: AWS Well-Architected Framework

• Operational excellence pillar
• Security pillar
• Reliability pillar

- Performance efficiency pillar
- Cost optimization pillar

Week 11: Intensive Exam Preparation

- Practice exams and review
- Weak areas reinforcement
- AWS whitepapers study
- Exam strategies and time management
- Project 3: Cloud-native blog platform

Week 12: AWS Cloud Practitioner Exam

- Final review and confidence building
- Take certification exam
- Celebrate achievement!
- Plan Phase 2 objectives
- Milestone: First AWS certification earned

4. Phase 2: Intermediate Skills (Weeks 13-28)

Goal: Master AWS architecture and earn Solutions Architect Associate certification

Month 4: Advanced Computing (Weeks 13-16)

Week 13: Advanced EC2 & Storage

• EC2 instance types and selection

• EBS volumes and snapshots

• EFS (Elastic File System)

• Storage Gateway

• Lab: High-availability storage solution

Week 14: Containerization with Docker

• Docker fundamentals and architecture

• Creating Dockerfiles

• Docker Compose for multi-container apps

• Container registries (ECR)

• Lab: Containerize web application

Week 15: ECS (Elastic Container Service)

• ECS clusters and task definitions

• Fargate serverless containers

• Load balancing with ALB/NLB

• Service discovery

• Lab: Deploy microservices on ECS

Week 16: Advanced Networking

• VPC peering and Transit Gateway

• VPN and Direct Connect

• PrivateLink and Endpoints

• Network troubleshooting

• Project 4: Multi-region architecture

Month 5: Infrastructure as Code (Weeks 17-20)

Week 17: Introduction to Terraform

• Infrastructure as Code principles

• Terraform basics and HCL syntax
• Providers and resources
• State management
• Lab: Deploy VPC with Terraform

Week 18: Advanced Terraform

• Modules and code organization
• Variables and outputs
• Remote state and backends
• Workspaces for environments
• Lab: Multi-environment infrastructure

Week 19: AWS CloudFormation

• CloudFormation templates
• Stacks and StackSets
• Change sets and drift detection
• Custom resources
• Lab: CloudFormation vs Terraform comparison

Week 20: Configuration Management

• Introduction to Ansible
• Playbooks and roles
• Inventory management
• AWS Systems Manager
• Project 5: Automated infrastructure deployment

Month 6: CI/CD & Automation (Weeks 21-24)

Week 21: CI/CD Fundamentals

• Continuous integration concepts
• Continuous delivery vs deployment
• Jenkins basics and pipelines
• Testing strategies
• Lab: Basic CI/CD pipeline

Week 22: AWS Developer Tools

• CodeCommit for source control
• CodeBuild for compilation
• CodeDeploy for deployment

• CodePipeline orchestration
• Lab: End-to-end AWS CI/CD

Week 23: GitHub Actions

• GitHub Actions workflows
• Automation and testing
• Secrets management
• Multi-stage deployments
• Lab: Deploy to AWS with GitHub Actions

Week 24: Advanced Automation

• Blue-green deployments
• Canary releases
• Rolling updates
• Rollback strategies
• Project 6: Full CI/CD for microservices

Month 7: Solutions Architect Prep (Weeks 25-28)

Week 25: High Availability & Disaster Recovery

• Multi-AZ and multi-region strategies
• Backup and restore procedures
• Pilot light and warm standby
• RTO and RPO planning
• Lab: Implement DR solution

Week 26: Performance & Cost Optimization

• CloudWatch detailed monitoring
• Cost allocation and reporting
• Reserved Instances and Savings Plans
• Architecture optimization patterns
• Lab: Cost optimization analysis

Week 27: Intensive SAA Exam Prep

• Practice exams and scenarios
• Weak area review
• Exam tips and strategies
• Time management practice
• Project 7: Enterprise architecture design

Week 28: Solutions Architect Associate Exam

• Final preparation

• Take certification exam

• Celebrate second certification!

• Prepare for Phase 3

• Milestone: AWS SAA certified

5. Phase 3: Advanced Operations (Weeks 29-40)

Goal: Master container orchestration and earn Kubernetes certification

Month 8: Kubernetes Fundamentals (Weeks 29-32)

Week 29: Introduction to Kubernetes

• Container orchestration concepts

• Kubernetes architecture

• Pods, Services, and Deployments

• kubectl command line

• Lab: Local Kubernetes with minikube

Week 30: Kubernetes Core Concepts

• ReplicaSets and StatefulSets

• ConfigMaps and Secrets

• Persistent Volumes

• Namespaces and RBAC

• Lab: Deploy multi-tier app on K8s

Week 31: AWS EKS (Elastic Kubernetes Service)

• EKS cluster creation

• Node groups and Fargate

• EKS networking

• Integration with AWS services

• Lab: Production EKS cluster

Week 32: Advanced Kubernetes

• Helm package manager

• Custom Resource Definitions

• Operators and automation

• Service mesh basics (Istio)

• Project 8: Kubernetes-based platform

Month 9: Monitoring & Observability (Weeks 33-36)

Week 33: Logging and Monitoring

• ELK Stack (Elasticsearch, Logstash, Kibana)

• CloudWatch Logs Insights
• Log aggregation strategies
• Distributed tracing
• Lab: Centralized logging platform

Week 34: Prometheus & Grafana

• Prometheus metrics collection
• PromQL query language
• Grafana dashboards
• Alertmanager configuration
• Lab: Complete monitoring stack

Week 35: Application Performance Monitoring

• X-Ray distributed tracing
• New Relic or DataDog
• SLIs, SLOs, and SLAs
• Error budgets
• Lab: APM implementation

Week 36: Incident Management

• On-call best practices
• Incident response procedures
• Post-mortem analysis
• Runbook creation
• Project 9: Complete observability platform

Month 10: CKA Certification (Weeks 37-40)

Week 37: Kubernetes Security

• Security best practices
• Network policies
• Pod security policies
• Image scanning
• Lab: Secure Kubernetes cluster

Week 38: Kubernetes Troubleshooting

• Debugging pods and services
• Network troubleshooting
• Performance tuning

• Cluster maintenance
• Lab: Troubleshooting scenarios

Week 39: Intensive CKA Exam Prep

• Practice exams (killer.sh)
• Hands-on scenario practice
• Time management drills
• Command memorization
• Project 10: Production-ready K8s platform

Week 40: CKA Certification Exam

• Final review and preparation
• Take CKA exam
• Celebrate third certification!
• Prepare for Phase 4
• Milestone: Kubernetes Administrator certified

6. Phase 4: Professional Mastery (Weeks 41-52)

Goal: Achieve professional-level expertise and final certification

Month 11: Advanced Architecture (Weeks 41-44)

Week 41: Microservices Architecture

- Microservices design patterns
- API Gateway and management
- Event-driven architecture
- Saga pattern for transactions
- Lab: Microservices implementation

Week 42: Serverless at Scale

- Advanced Lambda patterns
- Step Functions orchestration
- EventBridge for event routing
- Serverless Framework
- Lab: Serverless data processing

Week 43: Security & Compliance

- AWS Organizations and Control Tower
- Security Hub and GuardDuty
- Config and compliance automation
- Compliance frameworks (SOC 2, HIPAA)
- Lab: Enterprise security posture

Week 44: Migration Strategies

- 6 R's of migration
- AWS Migration Hub
- Database Migration Service
- Application Discovery Service
- Project 11: Cloud migration plan

Month 12: Professional Certification (Weeks 45-48)

Week 45: Advanced Networking & Hybrid

- Advanced VPC design
- Direct Connect and VPN

• Hybrid cloud architectures
• Multi-account networking
• Lab: Enterprise network topology

Week 46: Cost Optimization & FinOps

• Advanced cost optimization
• FinOps practices
• Spot instances and Savings Plans
• Reserved capacity planning
• Lab: Cost optimization project

Week 47: Professional Exam Preparation

• Practice exams and review
• Scenario-based study
• Whitepaper review
• Time management practice
• Project 12: Capstone architecture project

Week 48: Solutions Architect Professional Exam

• Final intensive review
• Take SAP certification exam
• Complete portfolio documentation
• Plan next career steps
• Milestone: Professional certification achieved!

Weeks 49-52: Optional Advanced Topics

Consider pursuing additional certifications or specializations: AWS DevOps Engineer Professional, CKS (Certified Kubernetes Security Specialist), HashiCorp Terraform Associate, or Azure/GCP certifications.

7. Project Portfolio

Throughout this program, you'll build 12+ production-quality projects that demonstrate your skills to potential employers:

#	Project Name	Description
1	Multi-tier Web Application	Deploy scalable web app with EC2, RDS, and ELB
2	Secure Three-Tier Architecture	Implement security best practices with VPC, security groups
3	Cloud-Native Blog Platform	Serverless blog with Lambda, API Gateway, DynamoDB
4	Multi-Region Architecture	High-availability system across multiple AWS regions
5	Automated Infrastructure	Complete IaC solution using Terraform and Ansible
6	Microservices CI/CD	End-to-end pipeline for containerized microservices
7	Enterprise Architecture	Complex multi-account AWS organization design
8	Kubernetes Platform	Production-ready K8s cluster with monitoring and security
9	Observability Platform	Complete monitoring solution with Prometheus and Grafana
0	Production K8s Platform	Enterprise-grade Kubernetes deployment on EKS
1	Cloud Migration Plan	Complete migration strategy for on-prem to cloud
2	Capstone Architecture	Comprehensive solution demonstrating all learned skills

8. Tools & Technologies

You'll gain hands-on experience with:

Category	Technologies
Cloud Platforms	AWS (primary), basics of Azure & GCP
Containers	Docker, Docker Compose, Podman
Orchestration	Kubernetes, EKS, ECS, Fargate
IaC	Terraform, CloudFormation, Pulumi
Config Management	Ansible, AWS Systems Manager
CI/CD	Jenkins, GitHub Actions, AWS CodePipeline, GitLab CI
Version Control	Git, GitHub, GitLab
Monitoring	Prometheus, Grafana, CloudWatch, ELK Stack
Scripting	Bash, Python, YAML
Networking	VPC, Route 53, CloudFront, Load Balancers
Security	IAM, KMS, Secrets Manager, Security Hub
Databases	RDS, DynamoDB, Aurora, ElastiCache

9. Learning Resources

Online Platforms:

- A Cloud Guru / Pluralsight - Comprehensive cloud courses
- Udemy - Cost-effective certification prep courses
- Linux Academy - Hands-on cloud labs
- AWS Training - Official AWS learning paths
- KodeKloud - Kubernetes and DevOps training

Books:

- **The Phoenix Project** by Gene Kim - DevOps culture and principles
- **The DevOps Handbook** by Gene Kim et al. - Implementation guide
- **Kubernetes Up & Running** by Kelsey Hightower - K8s fundamentals
- **AWS Certified Solutions Architect Study Guides** - Exam preparation
- **Site Reliability Engineering** by Google - SRE practices

Communities:

- Reddit: r/devops, r/aws, r/kubernetes
- Discord: DevOps and Cloud community servers
- Stack Overflow: Technical Q&A;
- AWS Community Builders Program
- CNCF Slack channels

Practice Labs:

- AWS Free Tier - 750 hours EC2, S3, RDS
- Katacoda - Interactive learning scenarios
- Play with Docker - Browser-based Docker practice
- Play with Kubernetes - Free K8s playground
- Terraform tutorials on HashiCorp Learn

10. Success Metrics & Tracking

Weekly Success Indicators:

- Complete all 5 scheduled study sessions (8 hours total)
- Finish weekly lab exercises and projects
- Document learnings in personal notes
- Engage with community (ask/answer questions)
- Update GitHub portfolio with code
- Review and plan next week's focus

Monthly Milestones:

- Complete 32+ hours of focused study
- Build 1 substantial project
- Master key technologies for that month
- Pass practice exams (certification months)
- Maintain GitHub activity streak
- Network with 5+ professionals

Portfolio Development:

Maintain a GitHub repository showcasing all projects with clear README files, architecture diagrams, and documentation. This portfolio will be crucial for job applications.

Career Preparation:

- Update LinkedIn profile with new skills monthly
- Write blog posts about your learning journey
- Contribute to open-source DevOps projects
- Practice technical interviews (months 9-12)
- Network at local meetups and conferences
- Build personal brand in DevOps community

Your Journey Starts Now!

You now have a comprehensive roadmap to becoming a certified DevOps Engineer and Cloud Solutions Architect. Remember:

- **Consistency beats intensity** - 8 hours weekly is better than cramming
- **Hands-on practice is essential** - Build, break, rebuild, repeat
- **Community accelerates learning** - Don't learn in isolation
- **Document everything** - Your notes become your knowledge base
- **Celebrate small wins** - Every completed week is progress
- **Stay curious** - Technology evolves, keep learning
- **Help others** - Teaching reinforces your knowledge

Your first study session begins Tuesday, November 4, 2025 at 6:00 PM (UTC+3).

See you in the cloud! ■■

Good luck on your DevOps journey!