



CodePro

Training, Consulting & Development



Kubernetes

Course Syllabus

02-3812001



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יפו 224, ירושלים



COURSE DESCRIPTION

This course provides a comprehensive understanding of Kubernetes, starting with an exploration of containerization's fundamentals before delving into Kubernetes' architecture, core concepts, and resource management.

It progresses into advanced features, exploring the extensive ecosystem of tools, best practices, and real-world scenarios.

COURSE INFO

Prerequisite knowledge

- Understanding of containerization principles
- Familiarity with Linux operating system

Target Audience

- DevOps engineers seeking proficiency in container orchestration
- System administrators aspiring to learn Kubernetes

Additional Information

- Hands-on labs and exercises will be provided
- Familiarity with cloud environments (AWS, GCP, Azure) is beneficial

MODULES

1. Introduction to Containerization and Kubernetes
2. Core Concepts and Resource Management
3. Kubernetes Ecosystem and Tools
4. Advanced Kubernetes Features
5. Security in Kubernetes
6. Deploying Applications on Kubernetes
7. Managing Kubernetes Clusters
8. Observability and Monitoring
9. Kubernetes Networking
10. Optimizing Kubernetes Performance
11. Best Practices for Scalability and Resilience
12. Kubernetes in Production
13. Case Studies and Real-World Scenarios
14. Future Trends and Emerging Technologies

Note: The modules and subtopics provided here are suggestions and can be tailored based on the specific requirements.

MODULE 1

Introduction to Containerization and Kubernetes

- Containerization fundamentals
- History and evolution of Kubernetes
- Kubernetes architecture overview
- Kubernetes components and their roles
- Installation methods and environments

MODULE 2

Core Concepts and Resource Management

- Pods: Creation and management
- Services and networking in Kubernetes
- Replication and scaling
- Resource allocation and management
- Health checks and self-healing mechanisms

MODULE 3

Kubernetes Ecosystem and Tools

- Kubernetes API and CLI usage
- Container runtime options
- Monitoring and logging tools
- Networking solutions (CNI)
- Storage options and management

MODULE 4

Advanced Kubernetes Features

- Deployments and StatefulSets
- Secrets and ConfigMaps
- Ingress controllers and load balancing
- Custom Resource Definitions (CRDs)
- Job and CronJob controllers

MODULE 5

Security in Kubernetes

- Role-Based Access Control (RBAC)
- Network policies and security contexts
- Service accounts and secrets management
- Security best practices
- Auditing and logging for security

MODULE 6

Deploying Applications on Kubernetes

- Helm and package management
- Continuous Integration/Continuous Deployment (CI/CD) pipelines
- Blue-green deployments
- Canary deployments
- Multi-environment deployments

MODULE 7

Managing Kubernetes Clusters

- Cluster upgrades and maintenance
- High Availability and Disaster Recovery
- Autoscaling clusters
- Multi-cluster management
- Federation and hybrid cloud scenarios

MODULE 8

Observability and Monitoring

- Prometheus and Grafana for monitoring
- Application and infrastructure metrics
- Tracing with Jaeger
- Logging with ELK stack
- Best practices for observability

MODULE 9

Kubernetes Networking

- Network plugins (CNI)
- Service discovery
- Ingress controllers and API gateways
- Load balancing strategies
- Troubleshooting networking issues

MODULE 10

Optimizing Kubernetes Performance

- Performance tuning for containers
- Resource optimization techniques
- Efficient scheduling and affinity/anti-affinity
- Garbage collection and resource cleanup
- Benchmarking and profiling applications

MODULE 11

Best Practices for Scalability and Resilience

- Horizontal and vertical scaling
- Fault tolerance mechanisms
- Load testing and performance analysis
- Designing for scalability
- Chaos engineering and resilience testing

MODULE 12

Kubernetes in Production

- Day-2 operations and management
- Incident response and troubleshooting
- Scalability challenges in production
- Backup and recovery strategies
- Compliance and governance considerations

MODULE 13

Case Studies and Real-World Scenarios

- Industry-specific Kubernetes use cases
- Case studies of Kubernetes adoption
- Challenges and solutions in real-world deployments
- Lessons learned from successful implementations
- Strategies for handling complex scenarios

MODULE 14

Future Trends and Emerging Technologies

- Kubernetes roadmap and upcoming features
- Edge computing and Kubernetes
- Serverless computing with Kubernetes
- AI/ML workloads in Kubernetes
- Evolving trends in container orchestration

צרו קשר

מי אנחנו?

חברה המעבירה הדרכות והשתלמויות בעולמות הטכנולוגיה וההייטק לארגונים ששואפים גבוה ורוצים לגעת בשיא הטכנולוגיה. ההדרכות מותאמות באופן אישי לכל מטרה, כאשר תכני הלימוד נבנים בהתאם לצורכי הארגון, יעדיו ודרישותיו. CodePro משמשת גם ככוח אדם ומספקת לארגונים מרצים, מפתחים ויועצים טכנולוגים על פי דרישה.

בנוסף לתחום ההדרכה, ל- CodePro בית תוכנה ומחלקת ייעוץ המלווה חברות הייטק וגופים טכנולוגיים בתהליכי פיתוח ממשקים מאתגרים. לצוות יכולת להעניק ייעוץ ותמיכה במקרים מורכבים בהם דרושה טכנולוגיה ספציפית, כמו גם בתהליך הקמת צוותים טכנולוגים בארגונים.

נשמח לשמוע ממכם!

לפרטים נוספים ושאלות

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