

AWS Cloud Projects: 5 Real-World Labs for Engineers

Build production-ready skills with step-by-step AWS projects. Ideal for software engineers and cloud practitioners.

DevOps Instructor: Derek Holtzman • 5 sections • 50 lessons • 16.50h total

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About this course

Engineers often know AWS theory but struggle to apply it in real scenarios. Without hands-on practice, designing scalable cloud solutions feels abstract and risky. This course bridges that gap through five progressive projects that mirror actual industry tasks. You'll work on serverless apps, high-availability setups, migrations, secure architectures, and IoT analytics, gaining confidence to handle complex AWS environments. Each project includes video walkthroughs, case studies from similar real-world implementations, and practical labs where you build from scratch.

Course curriculum

Foundations and Project 1: Serverless Image Processor

- Introduction to AWS Cloud and Project Setup (15m)
Set up your AWS account, install necessary tools, and understand the project goal.
- Core AWS Services for Serverless: S3 and IAM (20m)
Learn how to configure S3 buckets and IAM roles for secure access.
- Building a Lambda Function with AWS SAM (25m)
Write and deploy a Lambda function using the AWS Serverless Application Model.
- Event-Driven Design: S3 Triggers and Lambda Invocation (18m)
Set up S3 events to trigger Lambda for image processing.
- Image Processing Logic with Python and Boto3 (22m)
Implement code to resize images and save thumbnails.
- Storing Metadata with DynamoDB (20m)
Use DynamoDB to log processed images for tracking and queries.
- Testing and Deploying the Serverless Application (15m)
Run end-to-end tests and deploy the app to AWS.

Project 2: Highly Available WordPress on AWS

- Understanding High Availability and WordPress Architecture (15m)
Explore why HA matters and how to design a scalable WordPress site.
- Setting Up a VPC and Subnets for WordPress (20m)
Create a virtual network with public and private subnets for isolation.
- Launching EC2 Instances with Auto Scaling Groups (25m)
Configure EC2 instances to handle traffic spikes automatically.
- Configuring Elastic Load Balancer for Traffic Distribution (18m)
Set up an ELB to distribute requests across multiple instances.
- Database Layer with Amazon Aurora for WordPress (22m)
Deploy and manage a highly available Aurora database for WordPress.
- Shared File Storage with Amazon EFS (20m)
Use EFS to store WordPress files that are accessible to all instances.
- Installing and Configuring WordPress on the Infrastructure (30m)
Walk through the WordPress installation on the built HA environment.
- Security Best Practices for WordPress on AWS (18m)
Secure your setup with security groups, NACLs, and encryption.
- Performance Tuning and Caching Strategies (22m)
Optimize WordPress performance using caching plugins and AWS services.
- Monitoring and Maintenance with CloudWatch (15m)
Set up alarms and logs to monitor the health of your WordPress site.

Project 3: Cloud Migration of a Legacy Web App

- **Introduction to Cloud Migration: The 6 Rs Strategy (15m)**
Learn the different migration strategies and when to use them.
- **Assessing the Legacy Application with AWS Application Discovery Service (20m)**
Use tools to profile the existing app and plan the migration.
- **Planning the Migration with AWS Migration Hub (18m)**
Create a migration plan and track progress using the hub.
- **Lift-and-Shift to EC2: Moving the Application (25m)**
Execute the migration by deploying the app on EC2 instances.
- **Database Migration to Amazon RDS (22m)**
Migrate the database from on-premises to a managed RDS instance.
- **Post-Migration Optimization and Cost Management (20m)**
Optimize the migrated app for performance and reduce costs.
- **Setting Up CloudWatch for Monitoring and Alerts (18m)**
Implement monitoring to ensure the migrated app runs smoothly.
- **Testing and Validation: Ensuring a Successful Migration (15m)**
Conduct thorough testing to verify functionality and performance.

Project 4: Secure 3-Tier Architecture

- **Principles of 3-Tier Architecture and Defense-in-Depth (15m)**
Understand the layers and security principles for robust apps.
- **Designing a VPC with Multiple Availability Zones (20m)**
Set up a VPC spanning AZs for redundancy and isolation.
- **Creating Public and Private Subnets for Each Tier (22m)**
Configure subnets to separate web, app, and database tiers.
- **Configuring Security Groups for Web, App, and DB Tiers (18m)**
Define inbound and outbound rules to control traffic flow.
- **Setting Up NAT Gateway for Outbound Internet Access (15m)**
Allow instances in private subnets to access the internet securely.
- **Deploying the Web Tier with ECS Fargate (25m)**
Use containers to run the web application without managing servers.
- **Implementing the Application Tier with ECS Fargate (22m)**
Deploy the backend logic in a containerized environment.
- **Database Tier with Amazon RDS in a Private Subnet (20m)**
Launch an RDS instance securely in a private subnet.
- **Integrating All Tiers with Load Balancers and Service Discovery (25m)**
Connect the tiers using ALB and service discovery for communication.
- **Implementing Logging and Monitoring with CloudWatch (18m)**
Set up centralized logging and monitoring for all tiers.
- **Security Audits and Compliance Checks (20m)**
Review security configurations and ensure compliance with best practices.

- **Scaling and Auto-Adjustment Based on Load (22m)**

Configure auto-scaling policies to handle varying traffic.

Project 5: IoT Analytics & Anomaly Detection

- **Introduction to IoT on AWS and Project Overview (15m)**
Get an overview of AWS IoT services and the project goals.
- **Setting Up AWS IoT Core for Device Communication (20m)**
Register devices and configure MQTT topics for data ingestion.
- **Streaming Data with Kinesis Data Firehose (22m)**
Use Firehose to collect and deliver IoT data to storage.
- **Building a Data Lake with Amazon S3 (18m)**
Store raw and processed data in an S3 data lake for analysis.
- **Querying Data with Amazon Athena (25m)**
Run SQL queries on data stored in S3 using Athena.
- **Visualizing Data with Amazon QuickSight (20m)**
Create dashboards and reports to visualize IoT data trends.
- **Introduction to Anomaly Detection with AWS Lookout for Metrics (18m)**
Learn how Lookout for Metrics identifies unusual patterns in data.
- **Configuring Lookout for Metrics on IoT Data (22m)**
Set up detectors to automatically find anomalies in your data stream.
- **Setting Up Alerts and Notifications for Anomalies (15m)**
Configure SNS to send alerts when anomalies are detected.
- **Integrating Anomaly Detection with QuickSight Dashboards (20m)**
Overlay anomaly insights on your visualizations for better context.
- **Handling Data Quality and Pipeline Errors (18m)**
Implement error handling and data validation in the pipeline.
- **Optimizing Costs for IoT Analytics Pipeline (22m)**
Learn strategies to reduce costs without compromising performance.
- **Review and Next Steps: Extending the IoT Project (15m)**
Summarize what you've built and explore ideas for further development.

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