Cloud Developer Syllabus

Contact Info

While going through the program, if you have questions about anything, you can reach us at support@udacity.com. For help from Udacity Mentors and your peers visit the Udacity Classroom.

Nanodegree Program Info

Learning the fundamentals of cloud development and deployment with AWS. Then, build different apps leveraging microservices, Kubernetes clusters, and serverless application technology.

Prerequisite Skills

A well-prepared learner is able to:

- Knowledge of Computer Science and Javascript
- Knowledge of GIT and GITHUB
- Linux command line basics

Required Software

- AWS Regular Acct with CC
- Travis CI
- GitHub
- Docker, DockerHub
- Python 3.6 or latest
- Node, npm
- Ionic CLI, AWS CLI
- Postman, Postbird

Version: 2.0.0

Length of Program: 105 Days*

** This is a self-paced program and the length is an estimation of total hours the average student may take to complete all required coursework, including lecture and project time. Actual hours may vary.*

Part 1: Welcome to the Cloud Developer Nanodegree program

Part 2: Cloud Fundamentals

The cloud has become a key enabler for innovation with beneficial features like high availability, unlimited capacity, and on-demand scalability and elasticity. Learn the fundamentals of cloud computing while being introduced to compute power, security, storage, networking, messaging, and management services in the cloud. While learning the fundamentals, you will explore tools and services offered by Amazon Web Services (AWS) through interactive hands-on exercises. By the end of the course, you will have deployed your first website to AWS, and you will be prepared to continue your learning journey in the Cloud Developer nanodegree program.

Project: Deploy Static Website on AWS

In this project, you will deploy a static website to AWS.

Supporting Lessons

Lesson	Summary
Cloud Computing	Learn the basics of cloud computing including cloud deployment models, benefits, and popular options.
Foundational & Compute Service	Learn why we need servers, compute power, and security.
Storage & Content Delivery	Learn why we need storage and content delivery in the cloud.
Security	Learn the importance of security in the cloud.
Networking & Elasticity	Learn the basics of networking and elasticity in the cloud.
Messaging & Containers	Learn the basics of messaging and containers in the cloud.
AWS Management	Learn why we need logging, auditing, and resource management in the cloud.

Part 3: Full Stack Apps on AWS

Project: Udagram: Your Own Instagram on AWS

In this project, you will develop a cloud-based application for uploading and filtering images!

Supporting Lessons

Lesson	Summary
Cloud Basics	Learn key terminology and building blocks of a cloud system. Understand the design paradigm of modern cloud applications.
Develop	Implement a process so you write quality code, working alone or on teams. Unit and integration testing, a better way to git, and how to use packaged dependencies.
Storing Data in the Cloud	Set up and start using a cloud-based relational database for storing user data using AWS RDS. Implement a filestore for media like images using AWS S3.
Building and Deploying	Consume cloud data services (database and filestore) within your server application. Deploy your application using AWS Elastic Beanstalk.
User Authentication and Security	Cloud systems come with a new set of challenges to only allow authorized users access to sensitive information. Learn common mistakes and modern techniques for dealing with security.
Scaling and Fixing	Your work is never over. Cloud systems need to be maintained as dependencies are updated and there is more demand for your service. We explore tools and process to minimize growing pains

Project: Optimize Your GitHub Profile

Other professionals are collaborating on GitHub and growing their network. Submit your profile to ensure your profile is on par with leaders in your field.

Part 4: Monolith to Microservices at Scale

Project: Refactor Monolith to Microservices

In this project, you will take an existing application named Udagram and refactor it into a microservice architecture with lean services and deploy it using Kubernetes.

Supporting Lessons

Lesson	Summary
Introduction to Microservices	Using microservices is both a technical and business decision. In this lesson you will learn about the use cases that caused microservices to become popular.
Microservices Design Principles and Best Practices	When applied correctly, microservice architecture can deliver great business value. In this lesson, we will compare microservices and monoliths and discuss best practices for refactoring.
Containers Using Docker	Applications are often deployed in containers. In this lesson we'll learn why we use containers and how to use Docker to build our applications to be deployed as containers
Automating the Application Development Lifecycle	In this lesson we'll learn about why the industry embraces _Continuous Integration_ and _Continuous Deployment_ and how Docker helps streamline the process
Orchestration with Kubernetes	Kubernetes is a powerful tool that is often used to deploy containers. In this lesson we'll learn about why we would consider using Kubernetes and to deploy our applications
Best Practices/Design Patterns for Kubernetes in Production	In this lesson we'll learn some of the best practices for running your application in Kubernetes including logging, scale, and security

Part 5: Develop & Deploy Serverless App

Serverless technologies have become very popular recently because they can increase the speed of development and drastically reduce the cost of running a cloud infrastructure. This course combines the theory of using serverless technologies with the practice of developing a complex serverless application and focuses on learning by doing. You will learn advanced serverless features such as implementing WebSockets and stream processing and learn about serverless best practices throughout the course.

Project: Serverless Application

In this project, you will create a simple TODO application using AWS Lambda and Serverless framework.

Supporting Lessons

Lesson	Summary
Serverless Introduction	Introduction to the course, and Introduction to Serverless
REST API	In this lesson, we will cover the development of REST APIL for a group of images, how to store data in DynamoDB and build a web app using React.
Serverless Framework	In this lesson you will be introduced to the framework for Serverless and the various API we will be using.
Event Processing	In this lesson you will learn about event processing using Serverless. We will focus on processing different event types with Lambda functions.
Authentication	In this lesson, we cover authentication and authorization using Serverless. We will cover Authentication, OAuth, Auth0 protocols.
Best Practices	In this lesson, we will cover some best practices with Serverless.

Project: Improve Your LinkedIn Profile

Find your next job or connect with industry peers on LinkedIn. Ensure your profile attracts relevant leads that will grow your professional network.

Part 6: Capstone

Project: Capstone

In the capstone project, you'll build an application of your choice on AWS based on predefined criteria.

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