UDACITY
FOR ENTERPRISE

THE SCHOOL OF CLOUD COMPUTING

Cloud Architect using Microsoft Azure

NANODEGREE SYLLABUS

Overview

Cloud Architect using Microsoft Azure Nanodegree Program

This program will teach you how to become a cloud architect using Microsoft Azure, build a plan to migrate on-premises resources to the Azure Cloud and apply automation, high availability, and backup/recovery skills to the role of an Azure Cloud Architect, Cloud Server Engineer, Azure Security Engineer, DevOps Engineer and more.

The program consists of 3 courses and 3 projects. Each project you build will be an opportunity to demonstrate what you've learned in your lessons. Your completed projects will become part of a career portfolio that will demonstrate your mastery of Azure deployments, migration, setting up a highly-available infrastructure and securing your environment to potential employers.

Educational Objectives

Graduates of this program will be able to:

- Design and deploy scalable, efficient, and resilient cloud architecture with Azure.
- Execute a migration plan for on-premise servers and databases to Azure.
- Monitor availability and simulate and test failure scenarios and recovery.
- Optimize cloud service infrastructure for cost and performance.
- Evaluate a cloud environment's security vulnerabilities.
- Apply appropriate security controls that adhere to best practices in cloud security.

Program Information

TIME

3 months

Study 10 hours/week

LEVEL

Advanced

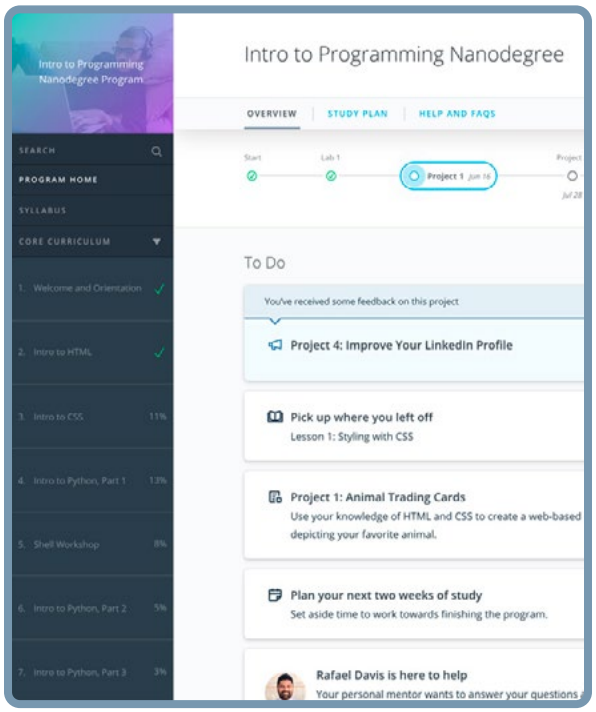
PREREQUISITES

- Familiarity with network concepts, such as IP addressing and routing
- Familiarity with network connectivity methods, such as VPN
- Familiar with Azure CLI commands
- Ability to read JSON
- Understanding of DevOps including container orchestration, CI/CD
- Azure application development and deployment
- 2+ years experience in developing apps or managing cloud infrastructure that have been deployed using Microsoft Azure

LEARN MORE ABOUT THIS NANODEGREE

Contact us at enterpriseNDs@udacity.com.

Our Classroom Experience



REAL-WORLD PROJECTS

Learners build new skills through industry-relevant projects and receive personalized feedback from our network of 900+ project reviewers. Our simple user interface makes it easy to submit projects as often as needed and receive unlimited feedback.

KNOWLEDGE

Answers to most questions can be found with Knowledge, our proprietary wiki. Learners can search questions asked by others and discover in real time how to solve challenges.

LEARNER HUB

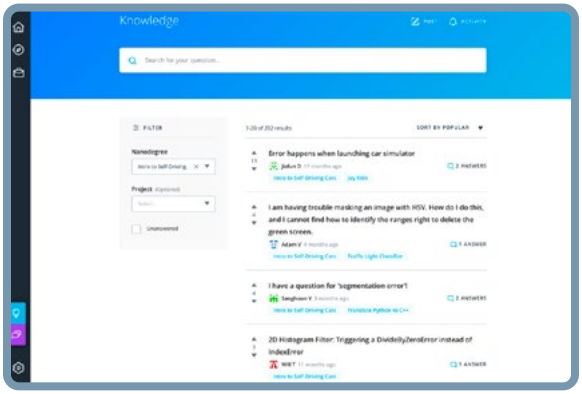
Learners leverage the power of community through a simple, yet powerful chat interface built within the classroom. Learner Hub connects learners with their technical mentor and fellow learners.

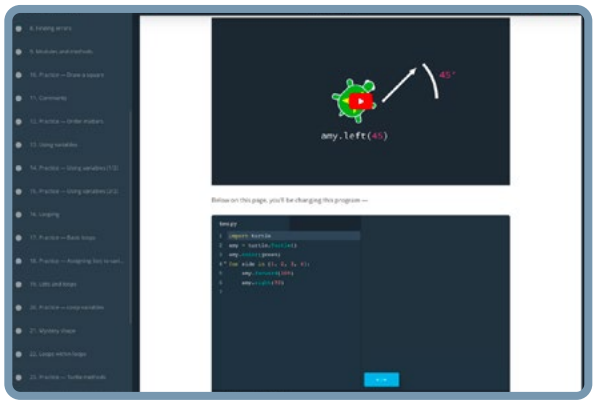
WORKSPACES

Learners can check the output and quality of their code by testing it on interactive workspaces that are integrated into the classroom.

QUIZZES

Understanding concepts learned during lessons is made simple with auto-graded quizzes. Learners can easily go back and brush up on concepts at any time during the course.





CUSTOM STUDY PLANS

Mentors create a custom study plan tailored to learners' needs. This plan keeps track of progress toward learner goals.

PROGRESS TRACKER

Personalized milestone reminders help learners stay on track and focused as they work to complete their Nanodegree program.

Learn with the Best

Gary McLeary

AZURE ARCHITECT / CLOUD ENGINEER

Gary is a Microsoft Certified Trainer and holds multiple Azure Certifications. He has multi-layered experience which includes working as a computer science professor at multiple colleges and universities for 6 years. His experience in the field includes working as a Cloud Server Engineer at Applied Innovations, and he also leads corporate training for small businesses.

Pratik Shah

CLOUD SOLUTIONS ARCHITECT

Pratik Shah is a Cloud Solutions Architect with experience over 10+ years in designing, developing and architecting various applications in both AWS and Azure. He also has teaching experience and has given many sessions at various NYC local meets. He is very passionate about upcoming new technologies including AI/ML.

Ed Clausen

MULTI CLOUD ENGINEER

Ed started working in the Azure cloud space in its early days at Microsoft as a member of the team working on what became Microsoft 365. He has never left. He has held many roles from support to manager of a support team. He is currently a Multi Cloud Engineer, but his focus is on Azure Active Directory.

Course 1: Designing Infrastructure and Managing Migration

In this course, you will go over the best practices for implementing High Availability within the Azure Cloud using different solutions. You will go through the process of creating a backup strategy/plan as well as discuss some of the components that will need to be included. You will also be exposed to the process of migrating on-premise resources into the Azure cloud by using built-in tools associated with Azure Migrate.

After successful migration, you will need to monitor the resources as well as optimize migrated resources to ensure they are running at their optimum level. You will be able to get information from Azure Advisor which will provide recommendations for existing resources as to what type of changes can be made to get the most cost-effective performance from our resources and the day-to-day monitoring will be done through Azure Monitor. Our final lesson will include the use of ARM Templates to automate the provisioning of resources using Infrastructure as code as well as enforcing an organization's policies and requirements automatically through Azure Policy and Azure Blueprint.

Project

Moving from On-Prem to the Azure Cloud

In this project, you will assume the role of a Cloud Architect working for Contoso, an online clothing merchandise company specializing in selling activewear. You will be given details about their infrastructure and start by creating a plan on how to migrate the current on-premises to similar infrastructure on Azure cloud services, including activities like finding matching services and resources, or perhaps even adding or subtracting from existing infrastructure. From there, you'll plan for high availability and disaster recoverability. Your plan will also include security measures and backup policy and an opportunity to recommend any design improvements.

Nanodegree Program Overview

LESSON TITLE	LEARNING OUTCOMES
AZURE CLOUD CAPABILITIES	• Use Azure cloud design best practices to set up a highly available infrastructure • Use different architecture styles to and design principles to meet the organizations SLA requirements • Use a VPN Gateway to connect from an on-premise environment to a resource within Azure • Use a Network Security Group to secure the network resources by restricting inbound/outbound traffic
DESIGNING FOR BACKUP & RECOVERY	• Create and implement a backup plan/strategy that will protect their environment against unexpected disasters using different tools within Azure • Backup on-premises and Azure Virtual Machines • Recover virtual machines/files in the event of data loss or a non-functional virtual machine • Determine the appropriate tool for site recovery
AZURE MIGRATION	• Evaluate the on-premises environment and identify what resources can be migrated and what order they should be migrated • Create a comprehensive strategy for the migration process • Use the appropriate tool to migrate resources into the Azure cloud as well as perform post migration procedures to ensure proper optimization after resources are migrated
AUTOMATION	• Use ARM Templates to deploy Infrastructure as Code • Use DSC to automatically check for possible configuration issues and make the necessary corrections when needed • Create, publish, and assign Blueprints that adhere to an organization's business requirements

Nanodegree Program Overview

Course 2: Provisioning for Cost Optimization and Monitoring

In this course, you will go over the best practices for understanding how cost management is an important aspect of a well architected-framework. For each lesson, you will learn the fundamental concepts, how experts think about the topic, and then deep dive into the Azure offerings.

Throughout the course, you will deep dive into how to design for a cloud optimized architecture instead of trying to apply the traditional on-premises architecture principles, how monitoring for cloud efficiency helps an organization bring transparency and visibility into cloud costs, and how to leverage automation of infrastructure autoscale as well as Azure available APIs for cost analysis to ensure cost transparency and savings.

Project

Cost Optimization and Monitoring for Your Engineering Company

In this project, you will take on the role of Azure Architect, wherein you will present to the CIO of your engineering company that has offices in both the U.S. East and West Coast a comprehensive plan to explain how Azure can not only provide resiliency but also has multiple controls to keep costs low if architected properly. You will also explain to the CIO of the company why moving the production workloads to Azure is beneficial in managing provisioned hardware effectively through tools available such as right sized VM.

Nanodegree Program Overview

LESSON TITLE	LEARNING OUTCOMES
DESIGN FOR COST OPTIMIZATION	• Apply the Azure Pricing Calculator to estimate required VM Elasticity, given a scenario • Estimate costs (on-prem or Cloud-based) using the appropriate Azure Calculator in a given scenario • Compare and contrast the benefits and uses of the Azure Pricing Calculator and the Azure Total Cost of Ownership Calculator • Azure Cost Management + Billing to run a report, given a set of parameters
MONITORING COST EFFICIENCY	• Identify the benefits of Azure Cost Management + Billing • Set limitations on spending across single and multiple resources • Use Azure policies to establish conventions for Azure resources with regards to policies and tagging Azure resources
MONITORING OPERATIONAL EFFICIENCY	• Create Azure dashboards and workbooks to monitor Azure resources • Choose the appropriate Azure monitoring tool to diagnose and troubleshoot issues within an Azure workload • Create policies to trigger alerts and automated actions in response to Azure workloads meeting specific budget thresholds
AUTOMATION	• Deploy automation to autoscale in or out based on the number of user per CPU • Create and analyze results of an event to ensure automation executes • Use APIs to leverage Cost Management + Billing for automated budgeting, cost tracking and cost optimization

Nanodegree Program Overview

Course 3: Azure Security

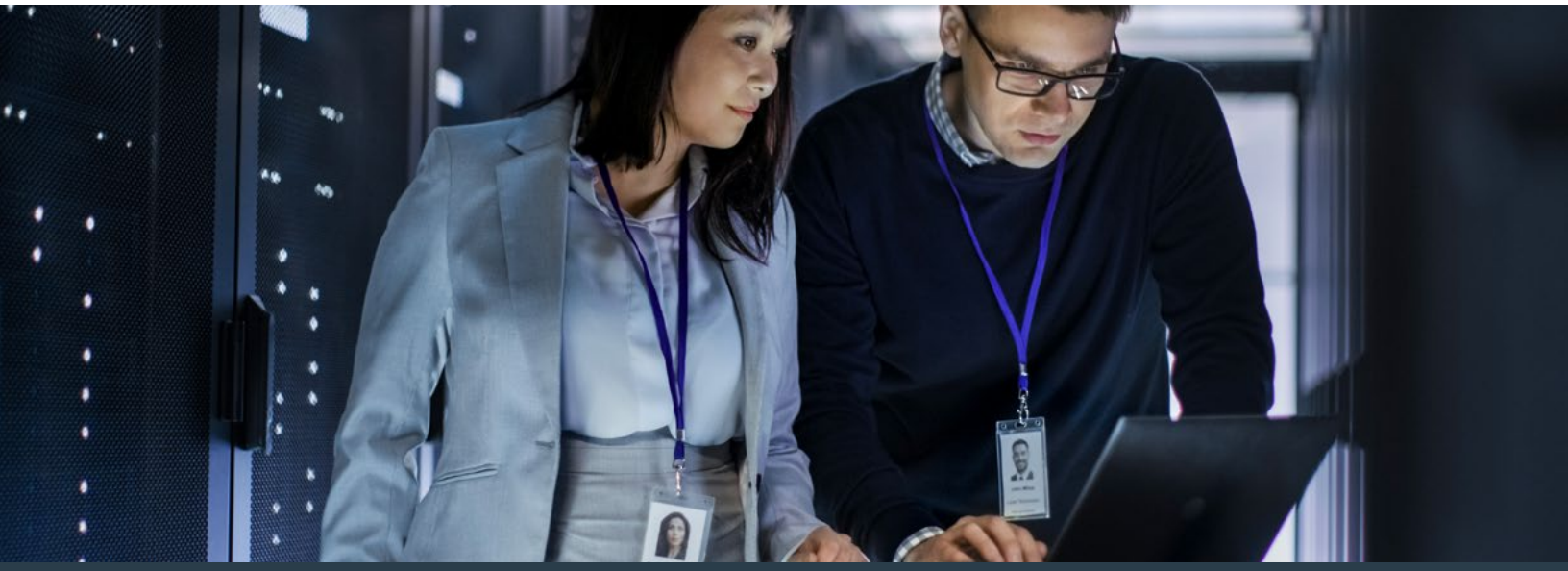
In this course, you will go over the best practices for understanding the role of security in an Azure environment. In each lesson, we introduce fundamental concepts, share how experts think about the topic and then deep dive into the Azure offerings with a series of demonstrations and practice exercises. Our focus is security: the Zero Trust Model will be our mantra.

The first lesson will give you a sense of how the course is designed, but also take a high-level look at security, take a look back at the history behind cloud computing and Azure, consider the major stakeholders you will interact within your new role and introduce the workspace simulation environment we use to provide access to the Azure portal.

In the next lesson, we will discuss the foundational level of security, (I)dentity (A)ccess (M)anagement. You will learn how to apply the tenets of Zero Trust by validating identities and granting least privilege.

In our discussion of infrastructure design, we will lay the foundational borders and gates of our digital environment. We will discuss how segmenting our resources determined by our company's organization, insulates and protects us in the case of eventual intrusion.

Finally, we will discuss the ongoing battle to maintain our security long after we have implemented our design. We will discuss how tools such as Security Center and Azure Sentinel can be used proactively and reactively to audit, monitor and alert us to possible attack or malevolent behavior.



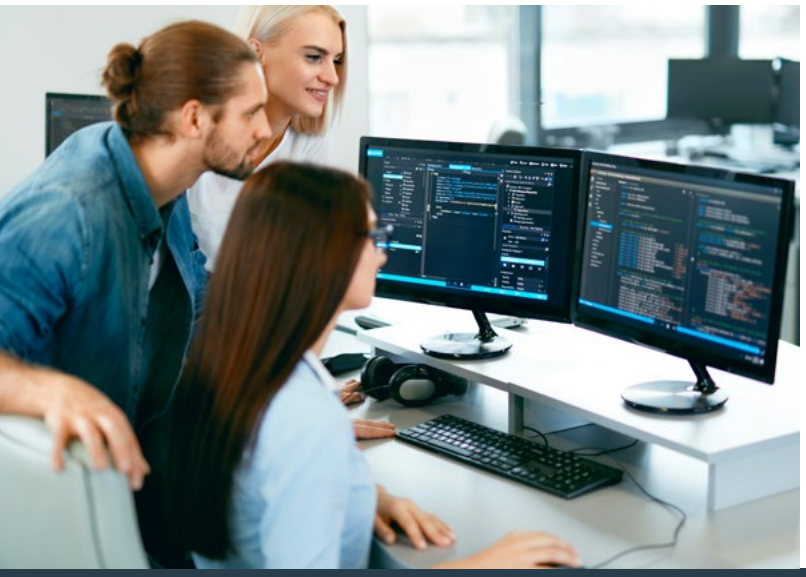
Nanodegree Program Overview

Project

Securing, Protecting, and Monitoring your Azure Environment

In a simulated real-world project, you are acting in the role of an Azure Cloud Architect for AKMade Enterprises. The company is a medium-size business and is recently seeing tremendous growth in its online presence. The leadership team has expressed a desire to start to utilize the cloud for most of their I.T. infrastructure. In this capacity, you have been asked to apply your newly acquired skills and understanding of the key areas of security, including IAM, network and security infrastructure, data security protection and monitoring.

With the skills gained through this course and the project, you will be better equipped to make informed decisions while architecting Azure and have proper controls and monitoring in place to tackle issues as an Azure Security Engineer and/or Azure Architect.



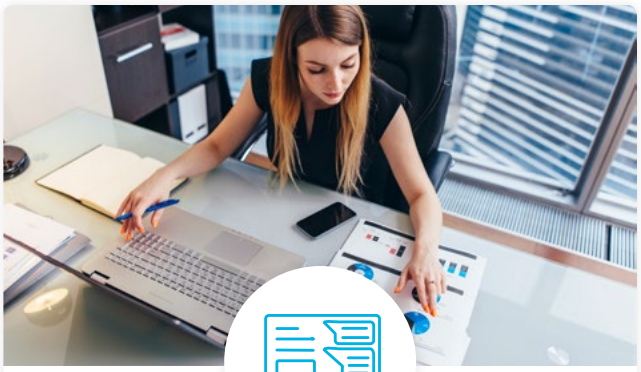
Nanodegree Program Overview

LESSON TITLE	LEARNING OUTCOMES
IDENTITY AND ACCESS MANAGEMENT	• Identify what IAM is • Use RBAC and PIM to enforce the principles of Zero Trust • Secure Authentication with Multi-Factor Authentication • Configure Conditional Access
INFRASTRUCTURE AND NETWORK SECURITY	• Explain how Zero Trust relates to Infrastructure and Networking • Design Network resources to provide security borders • Configure Azure Bastion • Configure Just in Time • Configure Azure Firewall
INTRODUCTION TO DATA SECURITY AND PROTECTION	• Configure Key Vaults to secure secrets, keys and certificates • Use Key Vaults to encrypt both virtual machines and databases • Secure virtual machines from malware and internet attacks • Configure auditing on SQL resources to understand who and what is accessing data • Enable Azure AD authentication on SQL providing additional protection over traditional SQL level authentication and threat protection
PROTECT AND MONITOR YOUR AZURE ENVIRONMENT	• Use the Security Center to understand your current security posture • Configure recommended best practice settings from within the Security Center • Configure Azure Defender for endpoint protection of resources • Configure Log Analytics Workspace for Azure Sentinel • Configure Data Connectors to provide logs for Azure Sentinel

Our Nanodegree Programs Include:

Pre-Assessments

Our in-depth workforce assessments identify your team's current level of knowledge in key areas. Results are used to generate custom learning paths designed to equip your workforce with the most applicable skill sets.



Dashboard & Progress Reports

Our interactive dashboard (enterprise management console) allows administrators to manage employee onboarding, track course progress, perform bulk enrollments and more.

Industry Validation & Reviews

Learners' progress and subject knowledge is tested and validated by industry experts and leaders from our advisory board. These in-depth reviews ensure your teams have achieved competency.

Real World Hands-on Projects

Through a series of rigorous, real-world projects, your employees learn and apply new techniques, analyze results, and produce actionable insights. Project portfolios demonstrate learners' growing proficiency and subject mastery.

Our Review Process

Real-life Reviewers for Real-life Projects

Real-world projects are at the core of our Nanodegree programs because hands-on learning is the best way to master a new skill. Receiving relevant feedback from an industry expert is a critical part of that learning process, and infinitely more useful than that from peers or automated grading systems. Udacity has a network of over 900 experienced project reviewers who provide personalized and timely feedback to help all learners succeed.

Vaibhav
UDACITY LEARNER

"I never felt overwhelmed while pursuing the Nanodegree program due to the valuable support of the reviewers, and now I am more confident in converting my ideas to reality."

now at

CODING VISIONS INFOTECH

All Learners Benefit From:

- Line-by-line feedback for coding projects
- Industry tips and best practices
- Advice on additional resources to research
- Unlimited submissions and feedback loops

How it Works

Real-world projects are integrated within the classroom experience, making for a seamless review process flow.

- Go through the lessons and work on the projects that follow
- Get help from your technical mentor, if needed
- Submit your project work
- Receive personalized feedback from the reviewer
- If the submission is not satisfactory, resubmit your project
- Continue submitting and receiving feedback from the reviewer until you successfully complete your project

About our Project Reviewers

Our expert project reviewers are evaluated against the highest standards and graded based on learners' progress. **Here's how they measure up to ensure your success.**

900+

Expert Project Reviewers

Are hand-picked to provide detailed feedback on your project submissions.

1.8M

Projects Reviewed

Our reviewers have extensive experience in guiding learners through their course projects.

3

Hours Average Turnaround

You can resubmit your project on the same day for additional feedback.

4.85 /5

Average Reviewer Rating

Our learners love the quality of the feedback they receive from our experienced reviewers.

UDACITY
FOR ENTERPRISE

2440 W El Camino Real, #101
Mountain View, CA 94040, USA - HQ

For more information visit: www.udacity.com/enterprise