Training Course on Cloud-Native GIS Applications on Azure

Professional Development Training Course Outline

Category	GIS	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Training Course on Cloud-Native GIS Applications on Azure explores the exciting convergence of **Geographic Information Systems (GIS)** and **Cloud-Native architectures** on the Microsoft Azure platform. Participants will gain **practical skills** in designing, developing, and deploying scalable, resilient, and cost-effective GIS applications leveraging Azure's robust ecosystem. We'll delve into key **cloud computing** concepts, **DevOps practices**, and **modern geospatial data management**, equipping professionals to build next-generation spatial solutions.

The program emphasizes **hands-on learning** with real-world scenarios, enabling attendees to confidently transition traditional GIS workflows to the cloud. You'll master essential Azure services like **Azure Kubernetes Service (AKS)**, **Azure Functions**, and **Azure Cosmos DB** for **spatial data processing**, analysis, and visualization. This course is crucial for anyone looking to **innovate** in the **geospatial industry** and harness the power of **cloud scalability** for complex **location intelligence** challenges.

Programme Curriculum

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Course Objectives

1. Grasp the core concepts of cloud-native development and their application to GIS.
2. Design **highly scalable** and **resilient GIS architectures** on Azure.
3. Utilize Azure storage and database services for **efficient geospatial data management**.
4. Master **Docker** and **Kubernetes** for **containerized GIS deployments**.
5. Develop **serverless GIS functions** using **Azure Functions** for event-driven processing.
6. Deploy and manage **GIS microservices** on **Azure Kubernetes Service (AKS)**.
7. Work with **PostGIS on Azure Database for PostgreSQL** and **Azure Cosmos DB** for spatial data.
8. Apply **Azure Machine Learning** and **AI services** for advanced **geospatial analytics**.
9. Automate **CI/CD pipelines** for GIS applications using **Azure DevOps**.
10. Implement **robust security measures** for spatial data and applications in the cloud.
11. Utilize **Azure Monitor** and **Application Insights** for performance monitoring.
12. Work with **cloud-native geospatial data formats** like COG for efficient imagery handling.
13. Develop **interactive web GIS applications** and **real-time spatial dashboards**.

Organizational Benefits

- Achieve **unprecedented scalability** for GIS operations, handling massive datasets and concurrent users with ease.
- Optimize resource utilization and minimize hardware investments by leveraging Azure's **pay-as-you-go model** and managed services.
- Foster **rapid development and deployment** of new GIS solutions through **DevOps automation** and cloud-native practices.
- Facilitate seamless **data sharing** and **real-time collaboration** across teams and geographies.
- Respond quickly to evolving business needs and market demands with **flexible, adaptable GIS applications**.
- Benefit from Azure's enterprise-grade security features and compliance certifications, safeguarding sensitive spatial data.
- Position your organization at the forefront of **geospatial technology** by adopting cutting-edge cloud solutions.

Target Audience

1. GIS Professionals & Analysts.
2. Software Developers.
3. Data Scientists.
4. Cloud Architects.
5. DevOps Engineers
6. Database Administrators.

7. Researchers & Academics.
8. IT Managers

Course Modules

Module 1: Introduction to Cloud-Native GIS & Azure Fundamentals

- Understanding Cloud-Native Principles and their relevance to GIS.
- Overview of Azure services for geospatial workloads.
- Setting up your Azure environment and resource groups.
- Exploring basic geospatial concepts and data types in a cloud context.
- **Case Study**: Migrating a legacy desktop GIS workflow to a basic Azure storage solution for improved accessibility.

Module 2: Azure Storage and Databases for Spatial Data

- Choosing the right Azure storage options for geospatial data (Blob Storage, Azure Data Lake).
- Working with **PostgreSQL with PostGIS** on Azure Database.
- Leveraging **Azure Cosmos DB** for NoSQL spatial data.
- Data ingestion and transformation techniques for cloud GIS.
- **Case Study**: Storing and querying large-scale LiDAR datasets in Azure Blob Storage and performing spatial queries using Azure Data Explorer.

Module 3: Containerization with Docker for GIS

- Introduction to **Docker** and containerization concepts.
- Containerizing common GIS tools and applications (e.g., GDAL, QGIS Server).
- Building and managing Docker images for geospatial services.
- Deploying single-container GIS applications on Azure Container Instances (ACI).
- **Case Study**: Packaging a custom Python script for geospatial analysis into a Docker image and deploying it for on-demand execution.

Module 4: Orchestrating GIS Applications with Azure Kubernetes Service (AKS)

- Fundamentals of **Kubernetes** and its architecture.
- Deploying and managing GIS microservices on **Azure Kubernetes Service (AKS)**.
- Scaling and self-healing of containerized GIS applications.
- Networking and load balancing for GIS services on AKS.
- **Case Study**: Deploying a distributed web GIS application with separate backend (PostGIS) and frontend (Geoserver/MapServer) services on AKS for high availability.

Module 5: Serverless GIS with Azure Functions & Logic Apps

- Introduction to **serverless computing** and its benefits for GIS.
- Developing **Azure Functions** for event-driven geospatial processing (e.g., image thumbnailing on upload, geocoding on demand).
- Orchestrating complex GIS workflows with **Azure Logic Apps**.
- Integrating serverless functions with other Azure services.
- **Case Study**: Creating an Azure Function that automatically processes newly uploaded satellite imagery, extracts features, and updates a spatial database.

Module 6: Geospatial Analytics and Visualization on Azure

- Performing **spatial analysis** using Azure Databricks and Spark with spatial libraries.
- Integrating **Azure Machine Learning** for predictive geospatial models.
- Building interactive **web GIS applications** using **Azure Maps** and open-source libraries.
- Visualizing **big spatial data** with Power BI and Azure Synapse Analytics.
- **Case Study**: Analyzing urban growth patterns using satellite imagery and machine learning models on Azure Databricks, then visualizing results in an Azure Maps web application.

Module 7: DevOps and CI/CD for Cloud-Native GIS

- Implementing **DevOps practices** for GIS application development.
- Setting up **Azure DevOps Pipelines** for Continuous Integration and Continuous Deployment (CI/CD).
- Automating infrastructure provisioning with **Azure Resource Manager (ARM) templates** or **Terraform**.
- Monitoring and logging for cloud-native GIS applications with **Azure Monitor** and **Application Insights**.
- **Case Study**: Establishing a CI/CD pipeline for a web GIS application, automating code deployment and infrastructure updates on AKS.

Module 8: Advanced Topics & Best Practices

- **Cloud-Optimized GeoTIFF (COG)** and other cloud-native geospatial formats.
- Implementing **security best practices** for GIS data on Azure (Azure Active Directory, network security groups).
- Cost optimization strategies for Azure GIS deployments.
- Disaster recovery and business continuity planning for cloud GIS.
- **Case Study**: Designing a resilient and cost-optimized architecture for a national geodatabase on Azure, incorporating COG for imagery and robust security measures.

Training Methodology

- Instructor-Led Sessions
- Hands-on Labs.
- Real-world Case Studies.
- Live Demonstrations
- Q&A and Collaborative Learning.
- Project-Based Learning.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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