Training Course on Cloud Computing and Edge AI for Agricultural Data Processing

Professional Development Training Course Outline

Category	Agriculture	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The intersection of Cloud Computing and Edge Artificial Intelligence (AI) is revolutionizing agricultural data management, empowering farmers and agri-tech experts to process, analyze, and act on real-time data with unprecedented precision. Training Course on Cloud Computing and Edge AI for Agricultural Data Processing provides an immersive learning experience focused on deploying scalable cloud infrastructures and intelligent edge solutions for agricultural applications. Participants will gain hands-on expertise in utilizing IoT devices, satellite imaging, edge servers, and cloud-based analytics to enhance decision-making, crop yield, and resource management.

As agriculture continues to embrace smart farming, this training equips professionals with cutting-edge tools and frameworks for leveraging AI-driven edge analytics and cloud platforms such as AWS, Azure, and Google Cloud. Participants will master the fundamentals of data ingestion, machine learning at the edge, and real-time anomaly detection—transforming traditional farming practices into resilient, data-driven systems. This course is essential for those looking to innovate in precision agriculture, sustainable farming, and AI-powered agritech solutions.

Programme Curriculum

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Course Objectives

1. Understand the fundamentals of Cloud Computing and Edge AI in agriculture.
2. Explore the architecture of AI-enabled IoT systems for farm-level deployment.
3. Implement real-time data processing using edge devices in field environments.
4. Analyze large-scale agricultural data using cloud-based platforms.
5. Deploy ML models at the edge for predictive crop health diagnostics.
6. Develop smart irrigation systems using sensor-based cloud integration.
7. Examine the role of 5G and edge computing in smart farming.
8. Secure agricultural data using cloud-native security frameworks.
9. Utilize geospatial data for yield prediction and soil analysis.
10. Integrate blockchain and cloud for agricultural traceability.
11. Apply data analytics and visualization tools for agricultural insights.
12. Leverage digital twin technology in precision agriculture.
13. Design and implement a scalable Edge AI-cloud hybrid system for agri-data workflows.

Target Audience

1. Agricultural Engineers
2. ICT Professionals in Agriculture
3. AI/Machine Learning Engineers
4. Government Agricultural Officers
5. Agri-Tech Entrepreneurs
6. Environmental and Soil Scientists
7. IoT System Developers
8. Data Scientists in Agri-Analytics

Course Duration: 10 days

Course Modules

Module 1: Introduction to Cloud Computing in Agriculture

- Overview of cloud computing concepts
- Cloud service models (IaaS, PaaS, SaaS)
- Benefits of cloud for agriculture
- Introduction to AWS, Azure, GCP for AgriTech
- Cloud vs. traditional farm IT systems
- *Case Study: Implementing Azure Cloud in a cooperative farm network*

Module 2: Fundamentals of Edge AI

- What is Edge AI and why it matters in agriculture
- Edge AI vs. Cloud AI
- Overview of popular edge devices (NVIDIA Jetson, Raspberry Pi)
- Edge AI lifecycle and deployment
- Introduction to TensorFlow Lite and ONNX
- *Case Study: Using Jetson Nano to detect crop pests in real-time*

Module 3: IoT in Smart Farming

- Sensors and data sources in agriculture
- Wireless communication protocols (LoRa, NB-IoT)
- IoT architecture for farm monitoring
- Sensor integration with cloud
- Edge-enabled sensor networks
- *Case Study: Sensor-based irrigation system in Kenyan maize farms*

Module 4: Agricultural Data Collection and Management

- Types of agricultural data (soil, weather, crop health)
- Data lakes and cloud storage
- Data quality, cleansing, and normalization
- Streaming vs. batch processing
- Real-time dashboards for farms
- *Case Study: Collecting and managing data from drone sensors in vineyards*

Module 5: Edge AI Model Development

- Data labeling and preprocessing
- Lightweight AI models for edge
- Training and testing models
- Tools: TensorFlow Lite, PyTorch Mobile
- Deploying to edge devices
- *Case Study: Disease prediction on tomato farms using edge-deployed CNNs*

Module 6: Cloud AI Model Deployment

- AutoML tools for agriculture
- Model deployment on AWS SageMaker / Google AI Platform
- API endpoints for cloud inference
- Monitoring and updating models
- Cost-optimization techniques
- *Case Study: Banana yield prediction using Google Cloud AI*

Module 7: Real-Time Edge Analytics

- Processing data at the edge
- Event-driven architecture
- Real-time alert systems
- Bandwidth optimization
- Fog computing in agriculture
- *Case Study: Livestock health tracking using wearable sensors and edge analytics*

Module 8: Geospatial Analysis for Agriculture

- Satellite imaging and remote sensing
- GIS platforms for agriculture
- Mapping soil variability and yield zones
- Image classification using AI
- Integrating with drones and cloud
- *Case Study: GIS-based pest forecasting in rice paddies*

Module 9: Smart Irrigation Systems

- IoT-based irrigation systems

- Edge-based moisture analysis
- Cloud-managed irrigation schedules
- Water usage optimization
- Predictive irrigation models
- *Case Study: Reducing water usage by 40% in semi-arid farms using AI models*

Module 10: 5G and Edge in Rural Connectivity

- Importance of 5G in agricultural zones
- Role of 5G in edge data transmission
- Network slicing for precision tasks
- Latency reduction with edge nodes
- Private 5G networks in agriculture
- *Case Study: Deploying 5G for autonomous tractors in Brazil*

Module 11: Cloud Security and Data Privacy

- Agricultural data privacy concerns
- Encryption techniques
- Identity and Access Management (IAM)
- Cloud compliance standards (GDPR, ISO)
- Risk mitigation strategies
- *Case Study: Securing cloud data for a national agri-research database*

Module 12: Blockchain for Agricultural Traceability

- Blockchain basics and smart contracts
- Farm-to-fork traceability use cases
- Blockchain and IoT integration
- Distributed ledger in supply chains
- Benefits for export compliance
- *Case Study: Coffee traceability using Ethereum-based blockchain*

Module 13: Data Visualization and Dashboards

- Visualization tools: Power BI, Tableau
- Real-time farm dashboards
- Visualizing geospatial and sensor data
- Custom alert dashboards for farmers
- Cloud-based reporting
- *Case Study: Building a dashboard for real-time tea leaf temperature monitoring*

Module 14: Digital Twin Technology in Agriculture

- What is a digital twin?
- Building digital replicas of farm operations
- Integrating IoT, AI, and simulation
- Predictive modeling and testing
- Digital twins for precision decision-making
- *Case Study: Wheat farm optimization using a digital twin model*

Module 15: Integrated Edge-Cloud Architecture

- Hybrid architecture design
- Synchronization between edge and cloud
- Use of Kubernetes and containerization

- Scaling AI models from edge to cloud
- Monitoring and orchestration tools
- *Case Study: Real-time sugarcane supply chain monitoring using hybrid architecture*

Training Methodology

- Hands-on labs and simulations
- Interactive lectures with expert facilitators
- Case study analysis and project-based learning
- Group discussions and technical brainstorming
- Real-time model deployment on cloud and edge devices

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	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

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