Training course on Automated Crop Health Assessment and Diagnosis (AI-driven)

Professional Development Training Course Outline

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

Course Introduction

The rapid advancement of Artificial Intelligence (AI) and machine learning (ML) is revolutionizing the agriculture industry. One critical area that is experiencing transformational change is crop health assessment and diagnosis. Traditional methods of crop monitoring are being replaced with AI-driven systems that enable real-time, scalable, and precise health diagnostics, minimizing losses and optimizing yields. Training course on Automated Crop Health Assessment and Diagnosis (AI-driven) introduces participants to cutting-edge agricultural technology, with a strong focus on computer vision, remote sensing, drones, precision farming, and AI-powered diagnostic tools.

This hands-on training empowers stakeholders across the agricultural value chain to leverage automated monitoring systems, enhance decision-making, and apply sustainable practices that boost productivity and resilience. Participants will explore data acquisition techniques, image analysis, predictive modeling, and automated disease detection using AI. With real-life case studies and practical modules, this course is ideal for anyone looking to future-proof their agricultural practice or service offering.

Programme Curriculum

Training course on Automated Crop Health Assessment and Diagnosis (AI-driven)

Introduction

The rapid advancement of Artificial Intelligence (AI) and machine learning (ML) is revolutionizing the agriculture industry. One critical area that is experiencing transformational change is crop health assessment and diagnosis. Traditional methods of crop monitoring are being replaced with AI-driven systems that enable real-time, scalable, and precise health diagnostics, minimizing losses and optimizing yields. Training course on Automated Crop Health Assessment and Diagnosis (AI-driven) introduces participants to cutting-edge agricultural technology, with a strong focus on computer vision, remote sensing, drones, precision farming, and AI-powered diagnostic tools.

This hands-on training empowers stakeholders across the agricultural value chain to leverage automated monitoring systems, enhance decision-making, and apply sustainable practices that boost productivity and resilience. Participants will explore data acquisition techniques, image analysis, predictive modeling, and automated disease detection using AI. With real-life case studies and practical modules, this course is ideal for anyone looking to future-proof their agricultural practice or service offering.

Course Objectives

1. Understand the fundamentals of AI in agriculture
2. Explore applications of machine learning for crop health monitoring
3. Learn techniques for AI-powered pest and disease detection
4. Integrate IoT sensors and drones for real-time data collection
5. Analyze data using computer vision in plant pathology
6. Build predictive analytics models for crop performance
7. Gain skills in remote sensing and satellite imagery
8. Implement precision agriculture tools for decision-making
9. Automate plant health diagnostics using AI algorithms
10. Explore deep learning in image-based plant disease diagnosis
11. Evaluate the impact of digital agriculture technologies
12. Study real-world AI-based crop monitoring case studies
13. Design a scalable AI-enabled farm monitoring system

Target Audiences

1. Agronomists
2. Agricultural Extension Officers
3. Farmers and Agripreneurs
4. Smart Agriculture Startups
5. AgriTech Software Developers
6. Environmental Scientists
7. Government Agricultural Planners
8. Precision Farming Consultants

Course Duration: 10 days

Course Modules

Module 1: Introduction to AI in Agriculture

- Overview of AI and ML in farming
- Digital transformation in agriculture
- Importance of crop health automation
- Key technologies enabling AI-based assessment
- Challenges and opportunities
- **Case Study: IBM Watson Decision Platform for Agriculture**

Module 2: Image Processing in Crop Health Monitoring

- Basics of digital image processing
- Leaf disease segmentation
- Color, texture, and pattern recognition
- Machine learning classifiers for disease detection
- Labeling and annotating datasets

- **Case Study: Tomato leaf disease classification using CNNs**

Module 3: Drone Technology and Remote Imaging

- Types of drones used in agriculture
- Multispectral and hyperspectral imaging
- Aerial data acquisition protocols
- Interpreting drone imagery
- Geotagging and spatial analysis
- **Case Study: Drone-based rice crop health assessment in India**

Module 4: Data Collection and Preprocessing

- Manual vs automated data collection
- Data cleaning techniques
- Dataset balancing for ML models
- Feature selection and extraction
- Annotation tools and labeling accuracy
- **Case Study: Preparing wheat rust image dataset for AI modeling**

Module 5: Machine Learning Models for Disease Detection

- Supervised vs unsupervised learning
- Decision trees, SVM, and random forests
- Evaluating model accuracy (F1, recall, precision)
- Overfitting and underfitting issues
- Tools: Python, TensorFlow, Scikit-learn
- **Case Study: Early blight detection using Random Forest classifier**

Module 6: Deep Learning in Agriculture

- Neural networks overview
- Convolutional Neural Networks (CNNs)
- Transfer learning and pretrained models
- GPU acceleration for deep learning
- Advantages of deep learning over traditional ML
- **Case Study: Identifying banana leaf disease with deep CNN**

Module 7: IoT for Real-Time Crop Monitoring

- IoT architecture for agriculture
- Smart sensors for soil and plant health
- Wireless networks and cloud integration
- Collecting real-time environmental data
- Alert systems and dashboard interfaces
- **Case Study: IoT-based smart greenhouse in Kenya**

Module 8: Satellite and Remote Sensing Applications

- Satellite imagery platforms (Sentinel, Landsat)
- Vegetation indices (NDVI, SAVI)
- Time-series crop health monitoring
- Climate pattern analysis
- Integrating satellite and drone data
- **Case Study: Maize yield prediction using NDVI**

Module 9: Precision Agriculture and Decision Support

- Site-specific management strategies
- Variable Rate Technology (VRT)
- Prescription mapping for fertilizers/pesticides
- Integrating GIS and AI
- Decision support system dashboards
- **Case Study: Precision soybean farming in Brazil**

Module 10: Mobile Applications for Diagnosis

- Key features of diagnostic apps
- User interface for rural communities
- Image upload and instant feedback
- Offline functionality and localization
- Integration with government advisory systems
- **Case Study: PlantVillage Nuru AI app for farmers**

Module 11: Big Data Analytics in Agritech

- Structured vs unstructured data
- Cloud storage and database management
- Data lakes and stream processing
- Predictive trends from historical data
- Data security and privacy in agriculture
- **Case Study: Big data-powered crop insurance in Nigeria**

Module 12: Climate-smart AI Solutions

- AI for weather pattern forecasting
- Pest and disease outbreaks modeling
- Heat stress analysis
- Water use efficiency optimization
- Adaptive crop planning
- **Case Study: AI-assisted drought management system in Ethiopia**

Module 13: Policy and Ethical Considerations

- Data ownership and farmer rights
- Bias in AI algorithms
- Digital divide and access issues
- Sustainable AI deployment
- Governance frameworks for AgriTech
- **Case Study: AI policy for digital farming in Rwanda**

Module 14: Designing Scalable AI Systems

- Architecture of scalable AI models
- Model deployment: cloud, edge, or hybrid
- Maintenance and updating of models
- Cost-benefit analysis
- Training local users and technicians
- **Case Study: AI platform for tea farmers in Sri Lanka**

Module 15: Capstone Project & Certification

- Problem definition and scope
- Dataset sourcing and model design

- Implementation and validation
- Documentation and presentation
- Peer feedback and expert review
- **Case Study: Trainee-led diagnosis model for cassava diseases**

Training Methodology

- Instructor-led interactive sessions
- Hands-on labs using real-world datasets
- Group projects and peer reviews
- Case study analysis and presentations
- Guest lectures from AgriTech industry leaders
- Continuous assessments and certification test

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

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$6,000
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:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com