Training Course on Open-Source Software and Hardware for Digital Farming

Professional Development Training Course Outline

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

Course Introduction

The global demand for sustainable and data-driven agriculture is reshaping how farming is approached. Digital farming powered by open-source software and hardware is enabling farmers to optimize productivity, monitor resources, and make informed decisions. From IoT-based sensors to farm management software and precision agriculture tools, open-source innovations are transforming traditional agricultural practices. Training Course on Open-Source Software and Hardware for Digital Farming is designed to empower stakeholders with the knowledge and practical skills necessary to implement, adapt, and innovate using open-source agricultural technologies.

As digital transformation in agriculture accelerates, the use of affordable and customizable open-source agri-tech tools is becoming essential. This course provides a comprehensive exploration of digital tools like Arduino, Raspberry Pi, FarmOS, and OpenAg. Participants will learn how to deploy these technologies to collect, analyze, and act on data—enhancing productivity, sustainability, and profitability. Whether you're a tech-savvy farmer, agricultural extension officer, or innovator, this course provides a springboard for smart and sustainable farming practices.

Programme Curriculum

Training Course on Open-Source Software and Hardware for Digital Farming

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Course Objectives

1. Understand the role of open-source innovation in smart agriculture.
2. Explore key digital farming tools and technologies for smallholder and large-scale farms.
3. Learn to install and configure open-source farm management systems like FarmOS.
4. Develop skills in IoT-based farm monitoring using Arduino and Raspberry Pi.
5. Apply precision agriculture techniques using real-time data collection.
6. Integrate remote sensing and geospatial tools in digital farming workflows.
7. Analyze and visualize farm data using open-source analytics platforms.
8. Implement automated irrigation systems using affordable hardware.
9. Build custom smart agriculture devices with open-source hardware.
10. Improve digital literacy among farmers using accessible agri-tech platforms.
11. Promote data-driven decision-making in agriculture using open data.
12. Design low-cost, scalable digital solutions for climate-smart farming.
13. Support local innovation and sustainability using collaborative open-source ecosystems.

Target Audiences

1. Smallholder farmers
2. Agricultural extension officers
3. Agritech entrepreneurs
4. Government agriculture departments
5. ICT developers in agriculture
6. Academic researchers and students
7. Non-governmental organizations (NGOs) in agriculture
8. Digital farming cooperatives and agribusinesses

Course Duration: 5 days

Course Modules

Module 1: Introduction to Open-Source in Agriculture

- Definition and principles of open-source software and hardware
- Importance in digital transformation of agriculture
- Overview of global open-source agri-tech tools
- Benefits and challenges of adopting open-source systems
- Key organizations and communities supporting open agri-tech
- **Case Study**: FarmHack – A global movement of open-source farming solutions

Module 2: Farm Management with Open-Source Tools

- Introduction to FarmOS and its architecture
- Setting up and customizing a digital farm dashboard
- Tracking crops, livestock, and inputs
- Integrating weather and satellite data
- Managing multi-user farm operations securely
- **Case Study**: Implementing FarmOS in a Kenyan organic farm

Module 3: IoT and Sensor Networks with Arduino & Raspberry Pi

- Basics of Arduino and Raspberry Pi in agriculture
- Setting up temperature, humidity, and soil moisture sensors
- Data collection and real-time monitoring
- Energy-efficient IoT devices for field use
- Open-source firmware for agriculture-specific needs
- **Case Study**: Automated greenhouse monitoring in Uganda

Module 4: Precision Agriculture with Open Tools

- Concepts of precision agriculture and site-specific farming
- Using open-source GIS software (QGIS)
- Variable rate application (VRA) and field mapping
- Collecting NDVI data from drones
- Data interoperability and integration
- **Case Study**: Precision maize farming using QGIS in Nigeria

Module 5: Remote Sensing and Drones in Digital Farming

- Basics of remote sensing and satellite imaging
- Open-source drone platforms and software (OpenDroneMap)
- Crop health monitoring from aerial data
- Stitching and analyzing drone imagery
- Applications for pest control and irrigation planning
- **Case Study**: Drone-assisted pest monitoring in Tanzanian tea farms

Module 6: Data Analytics and Visualization in Agri-Tech

- Introduction to data analytics using R and Python
- Connecting sensors to cloud databases (e.g., InfluxDB)
- Visualization tools like Grafana and Kibana
- Predictive analytics for yield forecasting
- Data sharing protocols and APIs
- **Case Study**: Yield prediction dashboard for rice farms in Bangladesh

Module 7: Smart Irrigation Systems

- Basics of smart irrigation and automation
- Building DIY irrigation systems with Arduino
- Weather-based irrigation scheduling
- Integrating solar-powered pumps and sensors
- Open-source irrigation control software
- **Case Study**: Solar drip irrigation for small-scale vegetable farms

Module 8: Building a Sustainable Open-Source Ecosystem

- Collaborative development in agriculture tech
- Community-driven innovation models
- Licensing and intellectual property in open-source
- Encouraging local adaptations and hackathons
- Funding and supporting innovation hubs
- **Case Study**: Open-source agri-tech incubator in India

Training Methodology

- Hands-on demonstrations using Arduino, Raspberry Pi, and FarmOS

- Interactive tutorials with real-time sensor data integration
- Group activities and workshops to build and test devices
- Peer learning and community collaboration through GitHub and forums
- Case-based learning with local and global examples
- Action planning sessions to design individual or organizational projects

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

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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

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