Training Course on GIS Mapping for Farm Zoning and Land Suitability Analysis

Professional Development Training Course Outline

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

Course Introduction

Precision agriculture and sustainable land management are key drivers of modern agribusiness. Training Course on GIS Mapping for Farm Zoning and Land Suitability Analysis focuses on GIS mapping, farm zoning, and land suitability analysis, empowering participants with advanced geospatial technologies to improve agricultural productivity and resource optimization. Participants will gain hands-on skills in utilizing remote sensing, spatial data analysis, and digital soil mapping tools for strategic farm planning and land-use management. With the increasing need to adapt to climate change and ensure sustainable food systems, integrating geoinformatics in agriculture is more critical than ever.

Designed for a broad spectrum of professionals, this training leverages cutting-edge GIS software, real-time satellite data, and AI-powered spatial decision tools. From soil fertility evaluation to topographic modeling and suitability scoring, learners will develop actionable skills to make data-driven decisions for farm zoning and crop optimization. The course aligns with current trends in smart agriculture, land resource planning, and environmental sustainability—making it an essential learning experience in the digital transformation of agriculture.

Programme Curriculum

Training Course on GIS Mapping for Farm Zoning and Land Suitability Analysis

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Course Objectives

1. Understand the fundamentals of GIS in precision agriculture.
2. Apply remote sensing techniques for farm zoning.
3. Use spatial analysis for crop suitability evaluation.
4. Generate and interpret soil maps using GIS tools.
5. Identify land constraints through geospatial data modeling.
6. Conduct topographic and slope analysis for farm layout planning.
7. Perform multi-criteria decision analysis (MCDA) for land suitability.
8. Utilize AI-integrated GIS software for smart farming.
9. Analyze satellite imagery for vegetation and NDVI assessments.
10. Develop customized farm zoning maps for crop rotation.
11. Integrate climate and soil data for adaptive land-use planning.
12. Conduct suitability classification using supervised and unsupervised methods.
13. Create data-driven strategies for sustainable land management.

Target Audiences

1. Agricultural extension officers
2. Environmental scientists
3. Land use planners
4. Soil scientists
5. GIS analysts and geographers
6. Agribusiness managers
7. University researchers and educators
8. Policy makers in agriculture and land management

Course Duration: 10 days

Course Modules

Module 1: Introduction to GIS in Agriculture

- Understanding GIS concepts and components
- Overview of geospatial technologies
- Benefits of GIS in modern agriculture
- Basic map reading and spatial data types
- Common GIS software tools
- **Case Study:** GIS adoption in Kenya’s smallholder farms

Module 2: Remote Sensing for Land Analysis

- Fundamentals of remote sensing
- Satellite platforms and sensors used in agriculture
- Image interpretation techniques
- Use of NDVI in vegetation monitoring
- Data download and preprocessing
- **Case Study:** Remote sensing for drought monitoring in Ethiopia

Module 3: Digital Soil Mapping

- Soil sampling techniques
- Georeferencing soil data
- Interpolation methods (e.g., IDW, Kriging)
- Soil property prediction using GIS
- Linking soil data with crop requirements
- **Case Study:** Digital soil fertility map of Ghana

Module 4: Topographic and Slope Analysis

- DEM and contour data usage
- Slope and aspect extraction
- Hillshade modeling
- Drainage and watershed delineation
- Impact of terrain on farm zoning
- **Case Study:** Terrain analysis for rice cultivation in Vietnam

Module 5: Crop Suitability Mapping

- Factors affecting crop suitability
- Spatial datasets required
- Criteria weighting and ranking
- Land capability classification
- GIS overlay analysis
- **Case Study:** Cassava suitability zones in Nigeria

Module 6: Land Use and Land Cover Mapping

- Classification techniques (supervised vs. unsupervised)
- LULC change detection
- Integration with climate data
- Accuracy assessment of LULC maps
- Land degradation assessment
- **Case Study:** Land cover change in Uganda’s farming zones

Module 7: Spatial Data Management

- Data formats and coordinate systems
- Spatial vs. non-spatial data
- Database creation and attribute tables
- Metadata standards
- Data quality and integrity checks
- **Case Study:** FAO geodatabase design for Ethiopia

Module 8: Farm Zoning and Plot Design

- Principles of farm zoning
- Parcel boundary delineation
- Plot-based soil suitability indexing
- Irrigation zone mapping
- Creating farm zoning layouts
- **Case Study:** Farm block zoning in Tanzania

Module 9: Multi-Criteria Decision Analysis (MCDA)

- MCDA framework in GIS

- Factor standardization and normalization
- Weighted overlay and scoring
- Suitability index creation
- Sensitivity analysis
- **Case Study:** MCDA for maize suitability in Malawi

Module 10: Spatial Decision Support Systems (SDSS)

- What is an SDSS?
- Components of spatial decision models
- Tools and platforms for SDSS
- Scenario modeling
- Policy planning applications
- **Case Study:** SDSS for land allocation in Rwanda

Module 11: Climate-Smart Land Use Planning

- Integrating agro-climatic data
- Risk zoning and climate variability
- GIS for climate adaptation in agriculture
- Long-term land suitability projections
- Mapping climate-resilient crops
- **Case Study:** Climate-smart zoning in Burkina Faso

Module 12: GPS Field Survey and Data Collection

- Introduction to GPS and mobile GIS
- Survey planning and data accuracy
- Using GPS in field data validation
- Importing GPS data into GIS
- Mobile data collection tools
- **Case Study:** Field mapping with GPS in Sudanese farms

Module 13: GIS for Irrigation and Water Management

- Mapping water sources
- Irrigation suitability mapping
- Water demand and crop water requirement mapping
- Spatial planning for irrigation networks
- Groundwater suitability indexing
- **Case Study:** GIS-based irrigation planning in India

Module 14: GIS Project Development and Reporting

- Setting project goals and objectives
- Data sourcing and planning
- Mapping workflow design
- Visualization and map layout
- Creating final reports and presentations
- **Case Study:** GIS reporting for World Bank-funded agriculture project

Module 15: Future Trends and Emerging Technologies

- Role of AI and ML in GIS agriculture
- Drones and UAVs in land analysis
- Blockchain for land data transparency

- IoT integration in smart farming
- Predictive modeling for land use change
- **Case Study:** Smart farm zoning in Netherlands using drones and AI

Training Methodology

- Hands-on GIS software tutorials using QGIS and ArcGIS
- Real-world project-based exercises with datasets
- Group discussions and peer-reviewed case studies
- Interactive presentations and guest speakers from industry
- Continuous assessment through mapping assignments
- Final capstone project presentation and peer feedback

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:

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