Renewable Energy Infrastructure Inspection Using Drones Training Course

Professional Development Training Course Outline

Category	Renewable Energy	**Duration**	5 Days
Base Fee	$3,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Renewable Energy Infrastructure Inspection Using Drones Training Course equips participants with practical knowledge and industry-relevant skills to apply UAV technology, drone inspection, aerial data acquisition, AI-powered analytics, remote sensing, and predictive maintenance across renewable energy assets. The course focuses on the inspection of solar farms, wind turbines, transmission infrastructure, substations, hydroelectric facilities, and battery energy storage systems, helping organizations improve asset visibility while reducing inspection time, operational disruption, and exposure to hazardous environments. Participants explore thermal imaging, high-resolution visual inspection, photogrammetry, LiDAR, GIS mapping, digital twins, defect detection, and condition assessment workflows.

Through practical exercises and real-world case studies, learners develop an end-to-end understanding of drone mission planning, flight operations, data capture, image processing, AI-assisted defect identification, reporting, compliance, and asset-management integration. The training emphasizes safety-first operations, risk assessment, data quality, cybersecurity, regulatory awareness, and actionable inspection reporting. By combining technical instruction with scenario-based learning, the course prepares professionals to support smart renewable energy operations, predictive maintenance, infrastructure resilience, digital transformation, and cost-effective asset management.

Programme Curriculum

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Course Objectives

1. Develop competency in UAV-enabled renewable energy infrastructure inspection.
2. Apply drone mission planning and autonomous flight workflows for inspection operations.
3. Perform high-quality RGB, thermal, multispectral, and LiDAR data acquisition.
4. Identify common defects in solar PV modules, wind turbines, towers, blades, and electrical infrastructure.
5. Use AI-powered computer vision for automated anomaly and defect detection.
6. Apply photogrammetry, 3D mapping, GIS, and digital-twin technologies to infrastructure assessment.
7. Conduct thermal inspections and hotspot analysis for solar and electrical assets.
8. Implement risk-based inspection, aviation safety, and operational risk management practices.
9. Evaluate drone inspection data for predictive maintenance and condition-based monitoring.
10. Produce professional inspection reports, defect maps, and asset-health dashboards.
11. Integrate UAV data with CMMS, GIS, asset-management, and digital transformation platforms.
12. Address data privacy, cybersecurity, regulatory compliance, and responsible AI considerations.
13. Design an end-to-end smart drone inspection strategy that improves efficiency, safety, reliability, and asset performance.

Target Audience

1. Renewable energy engineers and technical professionals.
2. Solar PV operations and maintenance teams.
3. Wind energy engineers and turbine technicians.
4. Drone/UAV pilots and remote-sensing specialists.
5. Asset integrity, inspection, and reliability professionals.
6. GIS, geospatial, photogrammetry, and surveying specialists.
7. Energy managers, project managers, and operations leaders.
8. HSE, compliance, digital transformation, and predictive-maintenance professionals.

Course Modules

Module 1: Fundamentals of Drone-Based Renewable Energy Inspection

- UAV technology

- Renewable asset inspection
- Inspection economics
- Digital inspection workflow
- **Case study:** deployment of UAV inspection across a utility-scale solar farm to identify operational inspection challenges and workflow improvements.

Module 2: Drone Mission Planning, Flight Operations & Safety

- Mission planning
- Risk assessment
- Automated flight
- Safety management
- **Case study:** planning a safe UAV inspection around a large wind farm with turbines, power lines, changing weather, and restricted operating zones.

Module 3: Sensors, Thermal Imaging & Advanced Data Capture

- RGB imaging
- Thermal imaging
- Multispectral and LiDAR
- Data quality
- **Case study:** thermal UAV inspection of a photovoltaic plant to detect abnormal module temperatures and prioritize maintenance.

Module 4: Solar PV Infrastructure Inspection

- PV defect detection
- Electrical infrastructure
- Thermal analytics
- Geospatial mapping
- **Case study:** using drone thermal imagery to create a prioritized maintenance map for a utility-scale solar installation.

Module 5: Wind Turbine & Structural Inspection

- Blade inspection
- Tower inspection
- Automated capture
- AI analytics
- **Case study:** comparing traditional rope-access inspection with UAV-assisted blade inspection to evaluate safety, coverage, and data efficiency.

Module 6: AI, Photogrammetry, GIS & Digital Twins

- Computer vision
- Photogrammetry
- GIS integration
- Digital twins
- **Case study:** developing a geospatial asset-health visualization that combines drone imagery, defect locations, and maintenance information.

Module 7: Data Analytics, Predictive Maintenance & Reporting

- Data processing
- Predictive maintenance
- Defect classification
- Inspection reporting.
- **Case study:** converting UAV inspection findings into a predictive-maintenance plan that prioritizes critical renewable energy assets.

Module 8: Regulatory Compliance, Cybersecurity & Integrated Inspection Strategy

- Regulatory awareness
- Compliance and governance
- Cybersecurity
- Integrated operations
- **Case study:** designing a scalable enterprise drone inspection program for a renewable energy operator managing multiple geographically distributed assets.

Training Methodology

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

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

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

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