# Training Course on Geospatial Data Science and GIS for E and P

Professional Development Training Course Outline

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

## Course Introduction

Geospatial Data Science and Geographic Information Systems (GIS) are revolutionizing the Exploration & Production (E&P) sector in oil and gas by enabling precise spatial analysis, intelligent resource mapping, and data-driven decision-making. Training Course on Geospatial Data Science & GIS for E&P empowers participants with the skills to integrate machine learning, remote sensing, spatial analytics, and big geospatial data to enhance operational efficiency and optimize exploration outcomes. Using advanced geospatial workflows and predictive models, learners will be equipped to solve real-world challenges across upstream energy operations.

As E&P companies navigate digital transformation and sustainability goals, mastering geospatial data science becomes crucial. With applications ranging from seismic interpretation to environmental risk management, this course provides deep, practical knowledge aligned with industry demands. Participants will gain hands-on experience using popular GIS platforms, open-source tools, Python-based geospatial libraries, and cloud-based geospatial analytics to extract actionable insights from complex spatial datasets.

## Programme Curriculum

**Training Course on Geospatial Data Science & GIS for E&P**

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sensing, spatial analytics, and big geospatial data to enhance operational efficiency and optimize exploration outcomes. Using advanced geospatial workflows and predictive models, learners will be equipped to solve real-world challenges across upstream energy operations.

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**Course Objectives**

1. Understand the fundamentals of Geospatial Intelligence for Oil & Gas.
2. Apply GIS mapping and spatial data modeling to exploration workflows.
3. Use remote sensing and satellite imagery for subsurface analysis.
4. Integrate machine learning with GIS for predictive analytics in E&P.
5. Analyze geospatial Big Data using open-source tools like Python, GDAL, and QGIS.
6. Build interactive web-based geospatial dashboards.
7. Enhance seismic data interpretation using GIS techniques.
8. Employ cloud-based geospatial computing platforms (e.g., Google Earth Engine).
9. Apply geostatistical techniques for reservoir analysis.
10. Automate geospatial workflows using Python and Jupyter Notebooks.
11. Understand regulatory and environmental compliance mapping.
12. Integrate spatial decision support systems for field development.
13. Develop geospatial risk models for operational safety in oilfield operations.

**Target Audience**

1. Geoscientists
2. Reservoir Engineers
3. Exploration Managers
4. Data Scientists in Energy
5. GIS Analysts
6. Environmental Engineers
7. Petroleum Engineers
8. Energy Sector IT Professionals

**Course Duration:** 5 days

**Course Modules**

**Module 1: Introduction to Geospatial Data Science in E&P**

- Basics of GIS and Spatial Data in Oil & Gas
- Overview of Coordinate Systems & Projections

- Data Types: Raster, Vector, and Tabular Data
- GIS Software Platforms Overview: ArcGIS, QGIS
- Introduction to Spatial Databases
- **Case Study**: Implementing GIS for initial basin analysis in shale exploration

**Module 2: Remote Sensing and Satellite Imagery Applications**

- Understanding Spectral Bands and Indices
- Image Preprocessing Techniques
- Change Detection and Land Cover Classification
- SAR and LiDAR Applications in Oilfield Terrain Analysis
- Multitemporal Image Analysis
- **Case Study**: Monitoring oil spill using Sentinel-2 and Landsat data

**Module 3: Python for Geospatial Analysis**

- Introduction to Python Geospatial Libraries (geopandas, rasterio, folium)
- Data Cleaning and Preprocessing
- Spatial Joins and Overlay Analysis
- Automating Tasks with Jupyter Notebooks
- Visualizing Results using matplotlib and plotly
- **Case Study**: Python-based pipeline corridor planning using open geospatial data

**Module 4: Machine Learning for Spatial Prediction**

- ML Fundamentals for Spatial Data (Regression, Classification)
- Feature Engineering for Geospatial Inputs
- Model Training & Validation Techniques
- Applying Random Forests and XGBoost in Exploration
- Evaluating Accuracy of Predictive Maps
- **Case Study**: Using ML to predict prospective zones from seismic and well data

**Module 5: Seismic Data Integration in GIS**

- Seismic Data Formats and Importing in GIS
- Seismic Attribute Analysis and Mapping
- Fault and Horizon Visualization
- Reservoir Characterization with Spatial Tools
- Linking Seismic with Borehole Data
- **Case Study**: Integration of seismic and well log data to build 3D subsurface models

**Module 6: Cloud-Based Geospatial Analytics**

- Introduction to Google Earth Engine (GEE)
- Uploading and Processing Large Datasets on GEE
- Real-Time Mapping with Cloud APIs
- Sharing and Embedding Interactive Maps

- Time-Series Analysis for Environmental Monitoring
- **Case Study**: Deforestation monitoring around onshore oilfields using GEE

**Module 7: Spatial Decision Support & Risk Analysis**

- Spatial Multi-Criteria Decision Making (SMCDM)
- Suitability Mapping for Drilling Locations
- Risk Zone Mapping for Environmental Hazards
- Combining GIS with IoT & Real-Time Monitoring
- Emergency Response Planning using Spatial Models
- **Case Study**: GIS-based risk model for offshore rig site selection

**Module 8: Regulatory Compliance & Environmental Mapping**

- Mapping Environmental Constraints
- Integrating Legal and Permitting Layers
- Buffer Analysis for Protected Zones
- Mapping Impact Zones for Drilling Operations
- ESG Reporting and Spatial Visualization
- **Case Study**: Environmental compliance mapping in Arctic oil exploration

**Training Methodology**

- Instructor-led sessions using real-world energy sector datasets
- Hands-on exercises with industry tools: ArcGIS, QGIS, Python, GEE
- Case study analysis and group project work
- Cloud-based lab access for data processing and modeling
- Pre- and post-assessment to evaluate learning outcomes
- Certificate of completion and digital badge

**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:

**Register Online Now**

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