MERCURY

Advanced GIS Spatial Analysis and Remote Sensing

16 – 20 May 2027
Amman (Jordan)



Dubai - UAE: +971 4 450 5697
Istanbul - Türkiye: +90 539 599 1206
Amman - Jordan: +962 79 712 3347

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Advanced GIS Spatial Analysis and Remote Sensing

Ref: 16037_1003688 **Date:** 16 – 20 May 2027 **Location:** Amman (Jordan) **Fees:** 4200 Euro

Advanced GIS spatial analysis and remote sensing take you past map making into modeling: network and hotspot analysis, terrain and raster modeling, and satellite and aerial image processing combined with your GIS layers. This 1-week course is for analysts, planners and engineers who already use GIS at work, and you leave with a Spatial Analysis Project File. This advanced GIS course is delivered by Mercury Training Center.

About This Course

Many GIS teams produce good maps but stop short of the analysis that answers where, how much and what changed. You should already create maps, edit layers and run basic queries in GIS software. You practice each method on prepared datasets and imagery, then apply it to an area from your own work.

Who It Is For

- GIS analysts who prepare spatial studies and decision maps for planners and managers.
- Urban and transport planners who test land use, zoning and route options.
- Environmental staff who track land cover, habitats and impacts over time.
- Utility and infrastructure engineers who manage networks and assets on a map.
- Emergency and risk teams who map hazards and plan response.

This course is not for people new to GIS, who should begin with an introductory mapping and spatial data course, nor for specialists who want to build image processing software, who suit a programming or remote sensing science course.

Competencies You Will Build

- Analysis-Ready Data Preparation: you clean, project and integrate datasets so results can be trusted.
- Network and Pattern Analysis: you find best routes, service areas and statistically significant hotspots.
- Surface and Raster Modeling: you derive slope, visibility and suitability from elevation and raster layers.
- Image Classification: you turn satellite and aerial imagery into land cover maps.
- Change Detection: you measure what changed between two dates of imagery and where.
- Geospatial Reporting: you present results in dashboards and maps that decision makers act on.

What You Will Be Able to Do

By the end of the course you will be able to:

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- From mixed GPS, survey and scanned map sources, build a geodatabase with metadata and checked accuracy.
- Given a facility network, calculate service areas and optimal routes and map the gaps.
- Using incident points, run hotspot analysis and separate real clusters from random patterns.
- Given an elevation model, produce terrain and 3D views for a construction or zoning decision.
- From two dates of satellite imagery, classify land cover and map the change between them.
- Using an interactive dashboard, present findings and recommendations to non-specialist stakeholders.

Course Content

Day 1: Analysis-Ready Spatial Data

- Raster, Vector and Attribute Data Models for Analysis
- Coordinate Systems, Georeferencing and Accuracy Checks
- GPS, Field Survey and Mobile GIS Data Collection
- Digitizing Scanned Maps and Metadata Creation
- Geodatabase Design, Data Validation and Cloud-Based Data Sharing

Day 2: Vector, Network and Pattern Analysis

- Overlay and Buffer Analysis for Siting Decisions
- Network Analysis for Route Optimization and Service Areas
- Hotspot Detection and Spatial Pattern Statistics
- Risk Mapping for Hazards and Disaster Response
- Vector Analysis for Utility Assets and Transport Corridors

Day 3: Raster, Terrain and 3D Analysis

- Raster Analysis for Land-Use and Environmental Studies
- Terrain Modeling and Surface Analysis From Elevation Data
- 3D Mapping for Urban Development and Smart City Planning
- GIS Inputs to Environmental Impact Assessment
- Suitability Modeling for Land-Use Planning and Zoning

Day 4: Remote Sensing and Image Processing

- Satellite and Aerial Image Acquisition for GIS Projects
- Image Processing and Interpretation of Multispectral Imagery
- Machine Learning Classification for Land Cover Mapping
- Change Detection for Environmental Monitoring
- Integrating Remote Sensing Outputs With GIS Layers

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Day 5: Applied Analysis Practice

- Exercise: Network and Hotspot Analysis on a Utility Dataset
- Exercise: Image Classification for an Agriculture or Energy Site
- Exercise: Interactive Dashboard and Map Report for Stakeholders
- GIS Task Automation, Data Ethics and Project Return Review
- Completing the Spatial Analysis Project File for Your Own Area

Case Studies and Exercises

These are suggested activities.

- Case study: a water utility plans a new pumping station; you run network and suitability analysis and recommend a site.
- Case study: a coastal city faces repeated flooding; you combine terrain models and imagery to map the areas at risk.
- Exercise: an agriculture authority wants crop area estimates; you classify satellite imagery and check the accuracy.
- Exercise: an energy company screens a corridor for a new line; you map constraints and present the options.

What You Take Back

You return with the Spatial Analysis Project File for an area you work on. In your first month back, use it to rerun the analysis on your current data, share the dashboard with decision makers and set up the image change check as a routine task.

- Geodatabase with metadata and accuracy notes.
- Network, hotspot and suitability analysis results.
- Land cover classification and change maps.
- Dashboard and map report with recommendations.

Quick Answers FAQ

What should I know before advanced GIS spatial analysis training?

You should already make maps, edit layers and run simple queries in GIS software. Familiarity with coordinate systems helps; remote sensing is introduced from the basics of imagery upward.

How does advanced GIS spatial analysis differ from an introductory GIS course?

An introductory course teaches what GIS is, how to manage data and how to make maps. The advanced level assumes those skills and spends the time on network, pattern and surface analysis and on processing satellite and aerial imagery with GIS.

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What does remote sensing add to GIS analysis?

Remote sensing supplies up-to-date imagery of large areas, so you can map land cover, measure change and see conditions on the ground without field visits. Combined with GIS layers, it shows both where things are and how they are changing.

What do I take back from advanced GIS and remote sensing training?

You take back the Spatial Analysis Project File: a checked geodatabase, network, hotspot and suitability results, land cover and change maps, and a dashboard report, built for an area you work on.

For Your Manager

After the course, the team member can prepare analysis-ready data, run network, hotspot and suitability analysis, classify satellite imagery and present results in dashboards. They return with a Spatial Analysis Project File for a current area of work, first used to support the next siting, planning or monitoring decision.