BLACKBIRD FOR TRAINING

Surveying and Geospatial Information Systems (GIS)

1 – 12 March 2027
Düsseldorf (Germany)



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Ref: 3254804_321863 **Date:** 1 – 12 March 2027 **Location:** Düsseldorf (Germany) **Fees:** 10600 GBP

Introduction

In the era of smart cities and digital transformation, surveying and geospatial information systems GIS are vital components for effective infrastructure development, land management, and environmental monitoring. This comprehensive training course is designed to equip professionals with advanced knowledge in both traditional surveying techniques and modern geospatial technologies.

Participants will learn to use industry-standard surveying equipment such as Total Stations, GNSS Global Navigation Satellite Systems, and GPS, alongside cutting-edge GIS mapping tools like ArcGIS and QGIS. Through a combination of theory, practical fieldwork, and lab-based exercises, attendees will master the skills to conduct precise land surveys, manage geospatial information, and perform spatial analysis for decision-making in urban planning, property surveying, environmental projects, and infrastructure development.

Course Objectives

By the end of this course, participants will be able to:

- Conduct accurate land surveys using modern surveying equipment like Total Stations and GNSS.
- Understand coordinate systems, geodesy, map projections, and data correction techniques.
- Utilize GIS mapping tools ArcGIS, QGIS for spatial data analysis, visualization, and management.
- Integrate data from GPS, remote sensing, and other geospatial information services into GIS platforms.
- Apply geospatial technologies in land planning, infrastructure development, environmental monitoring, and more.
- Manage geospatial information systems GIS effectively for surveying services and property surveying.

Course Outlines

Day 1: Introduction to Surveying and Geospatial Sciences

- Historical overview of surveying and the evolution of GIS.
- Basics of geodesy: datums, ellipsoids, and coordinate systems.
- Introduction to traditional surveying methods and their applications.
- Fundamentals of geospatial information systems: components, functions, and applications.
- Sectoral uses of geospatial information in urban planning, environmental monitoring, and utilities.



Day 2: Surveying Instruments and Field Operations

- Setup and operation of Total Stations.
- GNSS/GPS surveying methods, including RTK Real-Time Kinematic.
- Best practices for field data recording and data integrity.
- Control surveys, triangulation principles, and surveying definition.
- Safety measures and quality control during fieldwork.

Day 3: Leveling, Traversing, and Error Correction

- Concepts and methods of leveling in land surveying.
- Establishing vertical and horizontal control networks.
- Traverse computations and achieving closure.
- Identifying and correcting survey errors in geospatial information management.
- Practical exercises in measurement and adjustment.

Day 4: Introduction to GIS and Spatial Data Collection

- Overview of GIS systems and major platforms ArcGIS, QGIS.
- Differences between Raster vs. Vector data models.
- Techniques for digitization and georeferencing.
- Importing surveying data into GIS mapping.
- Data sources: satellite imagery, GPS, LiDAR, and underground surveying.

Day 5: Coordinate Systems and Geospatial Data Management

- Understanding coordinate reference systems and projections.
- Geospatial metadata and standardization practices.
- Ensuring data accuracy and integrity in geospatial information management.
- Creating and maintaining spatial databases.
- Handling various file formats and ensuring data interoperability.

Day 6: Spatial Analysis and Mapping

- Performing GIS spatial operations: buffering, overlay, and spatial joins.
- Querying attribute and spatial data for better analysis.
- Crafting thematic maps using cartographic principles.
- Understanding geospatial statistics and pattern analysis.
- Group exercises to develop spatial decision support solutions.



Day 7: Remote Sensing and Image Processing

- Principles of remote sensing and different sensor types.
- Interpreting satellite images and understanding resolutions.
- Image classification: supervised and unsupervised techniques.
- Using NDVI and other vegetation indices for environmental monitoring.
- Integrating remote sensing and GIS mapping for environmental projects.

Day 8: GIS and Survey Applications in Development

- Applying GIS for land administration and cadastral mapping.
- Surveying for infrastructure projects: roads, utilities, and bridges.
- Urban planning through zoning and land-use analysis.
- Infrastructure asset management with geospatial information systems.
- Project case studies from public and private sectors.

Day 9: Project Management, QA/QC, and Integration

- Planning geospatial projects: workflow and execution.
- Implementing QA/QC protocols for surveying services and GIS projects.
- Integrating GIS with CAD and BIM systems for advanced projects.
- Utilizing Mobile GIS and real-time data applications.
- Designing dashboards and reports with spatial insights.

Day 10: Final Practical Assessment and Wrap-up

- Group field project: surveying, data collection, and GIS map production.
- Data processing and final map presentation.
- Peer feedback and evaluation of field outputs.
- Review of latest trends in GIS and geospatial technologies.
- Final exam, certification, and closing remarks.

Why Attend This Course: Wins & Losses!

- Master Geospatial Techniques: Learn to handle both traditional surveying and GIS mapping efficiently.
- Utilize Industry-Standard Tools: Gain hands-on experience with Total Stations, GPS, ArcGIS, and QGIS.
- Enhance Decision-Making: Apply spatial analysis for strategic decisions in urban planning and infrastructure development.
- Field and Lab Experience: Participate in fieldwork and lab simulations to reinforce learning.
- Boost Career Prospects: Increase employability in government, construction, environmental sectors, and urban planning.



Conclusion

This course equips professionals with the expertise needed to excel in surveying and geospatial information systems GIS. Through a blend of hands-on training, project-based learning, and expert guidance, participants will leave with the confidence and skills to lead geospatial initiatives across various sectors.

Whether working in land-use planning, environmental monitoring, or infrastructure development, this course provides a solid foundation to leverage location-based technologies for impactful decision-making.

Join this course to become a leader in surveying and GIS, and drive smarter decision-making in projects that shape the future of our cities and landscapes.

